

# THE ORBWEAVERS OF THE GENERA *MOLINARANEA* AND *NICOLEPEIRA*, A NEW SPECIES OF *PARAWIXIA*, AND COMMENTS ON ORB WEAVERS OF TEMPERATE SOUTH AMERICA (ARANEAE: ARANEIDAE)

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**ABSTRACT.** Two genera of araneid orb weavers are endemic in temperate South America: *Molinaranea* and *Nicolepeira*. *Molinaranea* has seven species, the new genus *Nicolepeira* has three. About 40 names are available for the 10 species. Two new species are included, along with 21 new synonyms. In addition, one new species of *Parawixia*, *P. chubut*, is described. The introduced European orb weaver *Zygiella x-notata* is common in temperate South America. Synapomorphies place *Molinaranea* close to *Parawixia* and *Eriophora*. The placement of *Nicolepeira* is uncertain.

## INTRODUCTION

The lack of illustrations in older literature has heretofore prevented determination of common orb-weaving spiders from the temperate Neotropics. By using large museum collections, comparison of individuals from numerous separate expeditions has been possible.

The early describer was Nicolet (Levi, 1964). Nicolet was a French entomologist who lived part of his life in Chile; he died in 1872. His only publication is on the arachnids of Chile, in Gay's 1849 treatise on Chile (Nicolet, 1849). It contains descriptions of 297 species, most of them new (Bonnet, 1945: 35); for some species useful illustrations are presented.

Simon studied Chilean spiders (1884, 1887, 1888, 1896, 1901, 1904) and examined specimens of Nicolet that had been deposited in the Paris museum. Early in 1888, Simon reported that *Diphya* specimens of Nicolet were lost and that Nico-

let's descriptions were not recognizable. In 1887, he referred to the poor condition of Nicolet's specimens. In 1896, Simon synonymized *Epeira flavipes* Nicolet with *Argiope trifasciata*, placed *Epeira gasteracanthoides* in *Glyptocranium* [= *Mastophora*], and synonymized *Epeira rectangula* with *E. labyrinthica* (the last in error, Piel, 2001). But Simon did not say whether he examined Nicolet's specimens. In 1896, Simon also described and named *Araneus phacthontis*, *A. surcolorum*, and *A. titirus* as new species. In 1904, Simon synonymized *Epeira thalia*, *E. nigrata*, *E. inflata*, *E. erudita*, and *E. hispida* with *E. clymene*. Although Simon was aware of the unique pattern on the venter of the large *E. flaviventris*, he did not recognize that it was diagnostic, and that Nicolet had described the same species numerous times, usually on the basis of dorsal color variations of early instars, 2–5 mm in total length. Here I follow Simon's nomenclature, but instead of *flaviventris*, I use the older name *magellanica* for this common species. More recently, the name *cinaberina* has been used for this species by Mello-Leitão and by Schiapelli and Gerschman (1974). Specimens of *magellanica* were described earlier by Walckenaer (1847), who gave adequate characters and stated that the species came from the Strait of Magellan. Because only few other orb weavers occur there, no doubt exists as to its identity.

The few araneoid orb weavers found in Chile are listed in Table 1. Most are distinct from those of Peru to the north.

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TABLE 1. CHILEAN ARANEID ORB WEAVERS OTHER THAN *MOLINARANEA* AND *NICOLEPEIRA*. (THE GENERA *EUSTALA*, *MANGORA*, AND *VERRUCOSA* HAVE NOT BEEN REVISED AND MAY HAVE SPECIES IN CHILE.).

	Distribution	Citation
<i>Argiope trifasciata</i> (Forskål, 1775)	Cosmopolitan	Levi, 1968
<i>Aranicus alhuic</i> Levi, 1991	Endemic in Chile	Levi, 1991
<i>A. concepcion</i> Levi, 1991	Endemic in Chile	Levi, 1991
<i>A. huahum</i> Levi, 1991	Endemic in Chile	Levi, 1991
<i>A. talca</i> Levi, 1991	Endemic in Chile	Levi, 1991
<i>A. zapallar</i> Levi, 1991	Endemic in Chile	Levi, 1991
<i>Cyclosa serena</i> Levi, 1999	Argentina	Levi, 1999
<i>Larinia bivittata</i> Keyserling, 1884	Southern South America	Harrod et al., 1991
<i>Mastophora gastrocacanthoides</i> (Nicolet, 1849)	Endemic in Chile	Nicolet, 1849
<i>Mecynogea erythromela</i> (Holmberg, 1876)	Southern South America	Levi, 1997
<i>Metepeira compsa</i> (Clamberlin, 1916)	Northern Chile, Peru, Lesser Antilles, Brazil	Piel, 2001
<i>M. galatheae</i> (Thorell, 1891)	Argentina	Piel, 2001
<i>M. rectangula</i> (Nicolet, 1849)	Argentina	Piel, 2001
<i>M. tarapaca</i> (Piel, 2001)	Northern Chile, Southern Peru	Piel, 2001
<i>Orcpeira venustula</i> (Keyserling, 1880)	Southern South America	Levi, 1993
<i>Zygiella x-notata</i> (Clerck, 1758)	Import from Europe	Levi, 1974

Some have spread from or into Argentina. The Argentine area of South America has some species from the tropics as well as extensions of species distributions over the Andes. Unfortunately, few collections are available from Patagonia, leaving our knowledge incomplete.

#### METHODS AND ACKNOWLEDGMENTS

The methods used here were described in Levi (1993). In the descriptions, the distances between the eyes of the anterior row are expressed as diameters of the anterior median eyes (in profile); distances between eyes of the posterior row are given as diameters of the posterior median eyes (in profile). The shape of the ocular quadrangle is measured outside the eyes. Features in illustrations are indicated by the face of a clock. All species included here are relatively large and easily examined. Males and females are easy to match as they are frequently collected together and have similar ventral markings on the abdomen.

The following collections were used:

AMNH American Museum of Natural History, New York, United States; N. Platnick, L. Sorkin

BMNH Natural History Museum, London, England; P. Hillyard, F. Wanless

CAS California Academy of Sciences, San Francisco, California, United States; W. J. Pulawski, D. Ubick, C. Griswold

FSCA Florida State Collection of Arthropods, Gainesville, Florida, United States; G. B. Edwards

IRSNB Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium; L. Baert

MACN Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina; M. E. Galiano, C. L. Scioscia

MCZ Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, United States

MLP Museo de Universidad Nacional, La Plata, Argentina; R. F. Arrozpide, C. Sutton, L. A. Pereira

MNHN Muséum National d'Histoire Naturelle, Paris, France; J. Heurtault, C. Rollard

MNRJ Museu Nacional, Rio de Janeiro

- ro, Brazil; A. Timotheo da Costa, A. B. Kury
- NRMS Naturhistoriska Riksmuseet, Stockholm, Sweden; T. Kronstedt
- PAN Polska Akademia Nauk, Warszawa, Poland; J. Prószyński, A. Słojewska, W. B. Jedryczkowski, T. Heflejt
- ZMUC Zoologisk Museum, Copenhagen, Denmark; H. Enghoff, N. Scharff

I thank the curators of the collections for the time-consuming task of searching out and sending the specimens needed for study. C. Scioscia helped find some localities. W. Piel supplied me with some natural history observations. Laura Leibensperger aided in numerous ways. Lorna Levi, Laura Leibensperger, William Piel, and an anonymous reader read the draft of the manuscript and made valuable suggestions. R. Preston-Mafham provided me with black and white photographs. The project was started with the help of Public Health Service Research Grant AI-01944 from the National Institute of Allergy and Infectious Diseases, which included costs in part of a trip to South America (Levi, 1967). Publication costs were covered in part by the Wetmore-Colles Fund.

## TAXONOMIC SECTION

### *Molinaranea* Mello-Leitão

*Type species.* *Molinaranea molinai* Mello-Leitão, 1940: 238 (= *Molinaranea magellanica* Walckenaer). It is the only species in the genus cited by Mello-Leitão. The generic name is feminine.

*Diagnosis.* As in *Eriophora*, but not in *Paravixia*, the scape originates from the anterior of the epigynum and bends over itself to point posteriorly (Figs. 4–6, 40–42). The epigynum has a cavity on each side under the scape (Figs. 4, 5), with the floor of the cavity continuing posteriorly to form the posterior median plate (T-shaped in Fig. 6). In contrast, the posterior median plate of *Eriophora* is small and can be considered the first of the annuli of its

scape (Levi, 1970, figs. 12, 37). In *Paravixia* and *Ocrepeira* the posterior median plate extends anteriorly into the scape (Levi, 1992, figs. 10, 11, 1993, figs. 36, 37, 41, 42).

The palpus has the paramedian apophysis (PM) attached to the conductor (C) and pointing to 7:00 in the left palpus (Figs. 19, 30); the paramedian apophysis is pointed or rounded on its end. The paramedian apophysis lacks the finger that is present in *Paravixia* (Levi, 1992, fig. 7) and the free sclerite that is present in *Eriophora* (Levi, 1970, PM in fig. 4). The embolus (E) of all *Molinaranea* species appears to be distally filiform (Fig. 19, 30), unlike the robust emboli in *Eriophora* (Levi, 1970, fig. 4), *Paravixia* (Levi, 1992, figs. 7, 68), and *Ocrepeira* (Levi, 1993, fig. 32).

Females of *Molinaranea* species differ from *Araneus* females in lacking the distal pocket of the tip of the epigynal scape (Levi, 1991, fig. 1), and in not having the posterior median plate swollen ventrally (Levi, 1991, figs. 1, 2). Males of *Molinaranea* differ from *Araneus* males in having a paramedian apophysis in the palpus (PM in Figs. 19, 30), and the conductor is attached at the top of the sphere formed (behind C in Figs. 19, 30) by the tegulum, not on the edge of the tegulum as in *Araneus* (Levi, 1991, fig. 3). Males differ from most males of *Araneus* in having only one patellar macroseta in the palpus (Fig. 16).

*Description.* Female. Carapace with pair of indistinct, parallel, dorsal anterior lines (Fig. 1). Carapace usually light in color. Dorsum of abdomen variable in coloration, sometimes green. Venter of abdomen with distinctive color pattern (Figs. 11, 28, 52, 70). Thoracic area 1.5–1.8 times width of cephalic area (Fig. 1). Eyes subequal. Posterior median eyes 0.8–1 diameter apart, 2–5 diameters from laterals (Fig. 1). Median eye quadrangle as wide as long, narrower behind (measured around outside of eyes; Figs. 1, 3). Height of clypeus equals diameter of anterior median eyes

(Fig. 3). Femur shorter than combined patella and tibia (Plate 1D). Abdomen subspherical to oval or triangular, with pair of anterior humps (Figs. 8, 27, 36, 43, 51, 59, 69), sometimes with posterior tubercle (Fig. 59) or pairs of median tubercles (Figs. 7, 8).

Male. Coloration same or darker than in female. Cephalic region of carapace narrower than in females, about half width of thorax (Fig. 14). Eyes subequal. Anterior median eyes are 0.7–1.8 diameters apart, 0.7–2 diameters from laterals. Posterior median eyes 0.6–1 diameter apart, 2.7–5 from laterals. Eye quadrangle resembles that of female (Figs. 14, 16). Height of clypeus 1–2 diameters of anterior median eye (Fig. 16). Lateral eyes on tubercle (Fig. 14). Sternum of *M. magellanica* and *M. clymene* sometimes with pair of macrosetae at the posterior end. Tooth on endite (right of chelicera in Fig. 16). Palpal patella with one macroseta (Fig. 16). Macrosetae on fourth coxa of *M. magellanica* and *M. phaethontis*. Hook on first coxa (at 4:00 in Fig. 16) with corresponding groove on femur of second leg. In *Molinaranea clymene* and *M. magellanica*, ventral faces of all femora have a line of macrosetae, but no two individuals have same length and spacing of macrosetae. *Molinaranea mamifera* and *M. surculora* lack ventral row of setae on first and second femora. In *M. phaethontis* all femora lack ventral setae. Abdomen smaller, same shape as that of female (Figs. 12, 32, 39).

*Note.* Both Hogg (1913) and Mello-Leitão (1940) described the male and female of *Molinaranea magellanica* as separate species and Mello-Leitão placed them in separate genera as well, the female in *Eriophora* and the male in the new genus *Molinaranea*.

*Genitalia.* The epigynum may have a

long scape (Figs. 4, 5, 33, 34), surpassed in length only by the scape in species of *Eriophora* and *Paravixia* (Levi, 1992, figs. 136, 150). The scape originates from the anterior edge of the base as in *Eriophora*, but unlike *Eriophora* (Levi, 1970, figs. 5, 6) the base of the epigynum is large and has a cavity underneath the scape (Figs. 4, 5, 40, 56).

The paramedian apophysis (PM) of the male palpus is an extension of the conductor, and is pointed or truncate (Figs. 17, 19, 30, 45, 53), not disk-shaped as in *Paravixia* (Levi, 1992, fig. 7) or a separate sclerite as in *Eriophora* (Levi, 1970, fig. 4). The conductor (C) is attached in the middle of the bulb (Fig. 19) as in *Paravixia* (Levi, 1992, fig. 7). In *Eriophora* the conductor has separated from the paramedian apophysis and moved to the edge (Levi, 1970, figs. 2, 3) as in *Araneus palpi* (Levi, 1991, fig. 3). The median apophysis (M) is large, anchored in the radix (R), lacks spines or filaments, and resembles that of *Eriophora*, *Ocrepeira*, and *Paravixia*. Unlike related genera, the embolus (E) is thread-shaped (Figs. 19, 30, 62, 71). The terminal apophysis (A) is a narrow lobe (at 12:00 in Figs. 17, 19, 30, 38, 45, 53, 62). A subterminal apophysis may be present in the shape of projecting narrow bands (between A and E in Figs. 19, 30).

*Relationship.* *Molinaranea* has a paramedian apophysis (PM in Fig. 19) whose pointed or rounded tip is a synapomorphy with that of similar tip found in *Wixia*, *Pozonia*, and *Ocrepeira* (Levi, 1993, figs. 5a, 23, 32). The unusually long scape of the epigynum and long median apophysis (M) of *Molinaranea* (Figs. 1, 2, 17, 38) are synapomorphies with these structures in *Eriophora* (Levi, 1970, figs. 10, 12) and some *Paravixia* (Levi, 1992, figs. 136, 141) and *Ocrepeira* (Fig. 123; Levi, 1993, fig. 32).



Additional synapomorphies with these same genera are the attachment of the median apophysis (M) above the radix (R), the proximal sculpturing of the median apophysis at its insertion above the radix, the distal branching of the median apophysis (when present), and the projection of the median apophysis away from the palpal bulb (Figs. 17, 30).

Scharff and Coddington (1997) maintain that the paramedian apophysis attached to the conductor is not homologous with one detached from the conductor. However, the fact that *Molinaranea* has an attached paramedian apophysis, whereas *Eriophora* has a detached one is evidence in favor of the homology between these structures. Similar evidence can be found in *Cyclosa* (Levi, 1999).

*Natural History.* Most species for which the habitat is known came from wooded portions of the temperate areas, but perhaps this reflects only the preferred habitat frequented by collectors. The orb-web of *Molinaranea* may have a stabilimentum (Plate 1C).

*Distribution.* Only seven species are known, all from the temperate southern part of South America. One of the largest species (*M. magellanica*) is common at the cold southern tip of the continent, the Strait of Magellan and Tierra del Fuego (Map 1A).

*Separating Species.* The large genitalia are easy to examine and several species have diagnostic markings on the venter of the abdomen. The dorsal pattern of the abdomen can be quite variable.

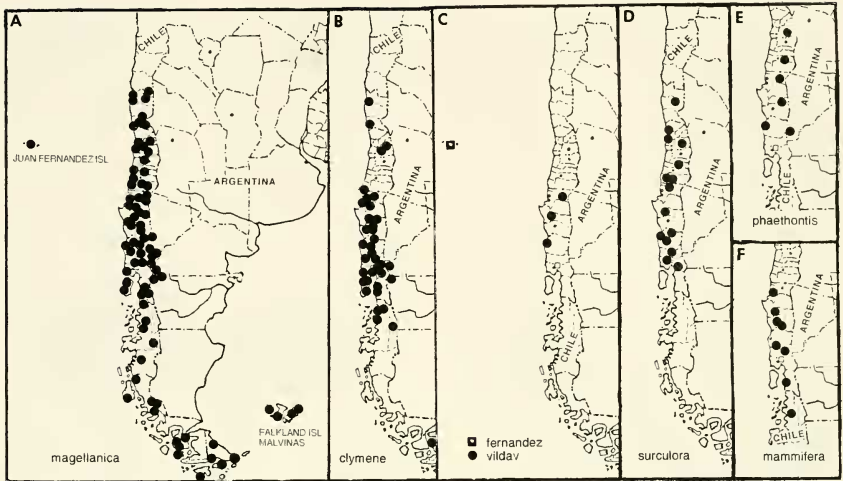
KEY TO FEMALE MOLINARAEA

- 1. Venter of abdomen with five black longitudinal lines separated by four white ones (as in Fig. 11) ..... *magellanica*
- Coloration of venter of abdomen otherwise (Figs. 28, 37) ..... 2
- 2(1). Scape of epigynum not extending beyond posterior margin of base (Fig. 66); length of abdomen about twice its width (Fig. 69) ..... *mannifera*
- Scape of epigynum extending posteriorly beyond base (Figs. 4, 23) ..... 3

- 3(2). Venter of abdomen with a pair of large white patches (Fig. 28) ..... *chymene*
- Venter of abdomen not marked or marked otherwise (Figs. 37, 44, 52, 60) ..... 4
- 4(3). Scape of epigynum extending four times the width of the base (Figs. 33, 37) ..... *villar*
- Scape of epigynum at most extending two or three times width of base (Figs. 40, 48, 56) ..... 5
- 5(4). Scape of epigynum with a constriction (Fig. 56); length of abdomen about one and one half times its width (Fig. 59); tubercles of abdomen large, extended posteriorly (Figs. 59, 61) ..... *phaethontis*
- Scape of epigynum with parallel margins (Figs. 40, 48); length of abdomen equals its width (Figs. 43, 51); tubercles small, extended laterally (Figs. 43, 51) ..... 6
- 6(5). Posterior median plate of the epigynum with raised septum between scape and posterior median plate (at 12:00 in Fig. 50) ..... *surculora*
- Posterior median plate separated by space from scape (at 12:00 in Fig. 42) ..... *fernandez*

KEY TO MALE MOLINARAEA

- 1. Venter of abdomen with five longitudinal black lines separated by four white ones (as in Fig. 11); median apophysis with terminal prong more than twice the length of "upper" prong (Figs. 17, 19, 20, 21) ..... *magellanica*
- Venter of abdomen marked otherwise (Figs. 28, 37); median apophysis prongs otherwise (Figs. 31, 38) ..... 2
- 2(1) Prongs on tip of median apophysis short, blunt, wider than long, tubercle-like (Figs. 53, 54) ..... *surculora*
- Prong on tips of median apophysis otherwise, pointed (Figs. 31, 38, 46, 63, 72) ..... 3
- 3(2) Duets of palpus forming a wide U-shaped structure as in Figure 71 ..... *mannifera*
- Embolus and duets in palpus straight, never U-shaped (Figs. 29, 38, 45, 62) ..... 4
- 4(3) "Upper" prong of median apophysis longer than "lower" prong (Figs. 45, 46, 62, 63) ..... 5
- "Upper" prong of median apophysis about same length as "lower" prong (Figs. 30, 31, 38) ..... 6
- 5(4) Duets of palpus curved at end (at 12:30 in Fig. 62); conductor (right of curved duct) with large tooth and smaller one (Fig. 62) ..... *phaethontis*
- Duets of palpus straight (Fig. 45); conductor with small tooth (Fig. 45) ..... *fernandez*
- 6(4) Venter of abdomen with a pair of white patches (Fig. 28); proximal end of median apophysis with blunt tooth (at 7:00 in Figs. 29, 30) ..... *chymene*
- Venter of abdomen without distinct mark-



Map 1. Distribution of *Molinaranea* species.

ings (Fig. 37); proximal end of median apophysis an enlarged, oval swelling (at 5:00 in Fig. 38) ..... *vildav*

***Molinaranea magellanica* (Walckenaer),  
new combination  
Plate 1B–D; Figures 1–22; Map 1A**

- Epeira magellanica* Walckenaer, 1847: 467. Specimens from Strait of Magellan, MNHN, lost.
- Epeira chilensis* Nicolet, 1849: 487. Female from Prov. Valdivia, Chile, MNHN 4102, probably not the holotype, examined. NEW SYNONYMY.
- Epeira cinaberina* Nicolet, 1849: 490, pl. 5, fig. 9, ♀. Female from central provinces, Santiago, Aconcagua, Chile in MNHN, lost. NEW SYNONYMY.
- Epeira flaviventris* Nicolet, 1849: 494. Female from Chile (MNHN), lost. Simon, 1854: 121, pl. 3, figs. 2–4, ♀. Simon, 1857: 10, pl. 2, fig. 2, ♀. Simon, 1896: 67. NEW SYNONYMY.
- Epeira quadripunctata* Nicolet, 1849: 495. Specimen from Chile (MNHN), lost. NEW SYNONYMY.
- Epeira obliterated* Nicolet, 1894: 496. Specimen from Valdivia (MNHN), lost. NEW SYNONYMY.
- Epeira affinis* Nicolet, 1849: 498. Immature holotype (?) from Valdivia, Chile, MNHN 3354, examined. NEW SYNONYMY.
- Epeira naevia* Nicolet, 1849: 499. Specimen from Chile (MNHN), lost. NEW SYNONYMY.
- Epeira dorsalis* Nicolet, 1849: 499. Specimen from Chile (MNHN), lost. NEW SYNONYMY.
- ?*Epeira quadrimaculata* Nicolet, 1849: 507. Specimens from Valdivia, Chile, lost. Synonymized with *flaviventris* by Archer, 1963: 25. NEW SYNONYMY.

- Araneus flaviventris*:—Simon, 1896: 67; Simon 1904: 95. Simon, 1901: 19. Simon, 1904: 95. Tullgren, 1901: 217. Tullgren, 1902: 32. Bonnet, 1955: 503.
- Araneus patagonicus* Tullgren 1901: 218. Immature holotype from Tweedie, Sierra del Toro [Sierra del Toro, 45°N, 69°W], Patagonia, Argentina, in NRMS, examined. Bonnet, 1955: 563. NEW SYNONYMY.
- Araneus vallentini* Hogg, 1913: 37, pl. 1, figs. 3a–3c, ♀. Female syntype from Falkland Islands in BMNH, examined. Synonymized with *Araneus cinaberinus* by Schiapelli and Gerschman, 1974: 86. NEW SYNONYMY.
- Araneus globiger* Hogg, 1913: 39, figs. 4a–4e, ♂. Male syntype from Falkland Islands, in BMNH, examined. Synonymized with *cinaberina* by Schiapelli and Gerschman, 1974: 86. NEW SYNONYMY.
- Eriophora wagenkuechti* Mello-Leitão, 1940: 236, fig. 24, ♀. Female holotype from Juan Fernández Islands in MNRJ, examined. Synonymized with *Araneus cinaberinus* by Schiapelli and Gerschman, 1974: 107. NEW SYNONYMY.
- Molinaranea molinae* Mello-Leitão, 1940: 238, fig. 25. Male holotype from Juan Fernández Islands (MNRJ), examined. Synonymized with *A. cinaberina* by Schiapelli and Gerschman, 1974: 107. NEW SYNONYMY.
- Aranea affinitata* Roewer, 1942: 836. New name for

*Epeira affinis*, Nicolet, preoccupied by *Epeira affinis* Blackwell, 1846. NEW SYNONYMY.

*Aranea chilensis*:—Roewer, 1942: 839.

*Aranea cinaberina*:—Roewer, 1942: 839.

*Aranea dorsatula* Roewer, 1942: 841. New name for *dorsalis* Nicolet, as name preoccupied by *Aranea dorsalis* Fabricius, 1775. NEW SYNONYMY.

*Aranea flaviventris*:—Roewer, 1942: 842.

*Aranea magellanica*:—Roewer, 1942: 846.

*Aranea naevia*:—Roewer, 1942: 848.

*Aranea obliterata*:—Roewer, 1942: 849.

*Aranea patagonica*:—Roewer, 1942: 849.

?*Aranea quadrimaculosa* Roewer, 1942: 850. New name for *Aranea quadrimaculata*, which is preoccupied by A. DeGeer, 1775. NEW SYNONYMY.

*Aranea quadripunctatula* Roewer, 1942: 850. New name for *Aranea quadripunctata*, which is preoccupied by Linnaeus, 1758. NEW SYNONYMY.

*Araneus affinis*:—Bonnet, 1955: 425.

*Araneus chilensis*:—Bonnet, 1955: 457.

*Araneus cinnaberinus*:—Bonnet, 1955: 458. Schiapelli and Gerschman, 1963: 107, 1974: 86.

*Araneus dorsalis*:—Bonnet, 1955: 498.

*Araneus magellanicus*:—Bonnet, 1955: 533.

*Araneus naevius*:—Bonnet, 1955: 548.

*Araneus obliteratus*:—Bonnet, 1955: 554.

*Araneus quadrimaculatus*:—Bonnet, 1955: 580.

*Araneus quadripunctatus*:—Bonnet, 1955: 580.

*Parawixia cinnaberina cinnaberina*:—Archer, 1963: 24.

*Parawixia cinnaberina tigrina* Archer, 1963: 24. Male and female syntypes from Prov. Valparaíso, Ventanas, Horcones, Quinteros, Chile, in AMNH, examined. NEW SYNONYMY.

*Note.* Only the availability and comparison of large collections made it possible to solve numerous synonymies.

Nicolet described and named this species several times, most from specimens 3–5 mm in total length, one-third adult size. For all, he gave the diagnostic character, the ventral abdominal pattern (Fig. 11).

Walckenaer's (1847) description of *Epeira magellanica* was overlooked by Nicolet and also by Tullgren. Simon (1864), who mentions *Epeira magellanica*, did not re-

alize that it is the same species that he, and later Tullgren, called *Epeira flaviventris*. Neither did he recognize that the ventral pattern of the abdomen he illustrated (1884, figs. 2–4) is diagnostic for the species and is also found in specimens from the Strait of Magellan area, the type locality of *Epeira magellanica*.

Simon and Tullgren did not know that some specimens may have a dorsally spotted abdomen, called *cinnaberina* by Nicolet (1849, pl. 5, fig. 9; Plate 1B, Fig. 9). This coloration was later used by Archer (1963) as basis for the subspecies *Parawixia cinnaberina tigrina* (*leopardina* might have been more appropriate). This is a color morph, not a subspecies.

A female from Santa Cruz, Chile (MNHN 12473, det. Simon as *cinnaberina*) was examined. All specimens determined as *Araneus flaviventris* by Simon in the MNHN are *Molinaranea magellanica*. Also examined was a specimen of *Epeira flaviventris* from Cape Horn, Mision du Cap Horn, 1882–1883, accompanied by a notation that it is the same as *chilensis*. This specimen was cited by Simon (1896: 67). *Epeira quadrimaculata* was synonymized by Archer (1963), with no reasons given; the synonymy is not convincing. *Epeira chilensis* was erroneously placed in *Metepeira* by Archer (1963).

Bonnet, as for many names, corrected the spelling of *cinnaberina* to *cinnaberina*. This is an invalid correction.

The immature holotype of *Araneus patagonicus* Tullgren is placed here on the basis of the shape of the abdomen and the color pattern of its venter. More recently, both Hogg (1913) and Mello-Leitão (1940)

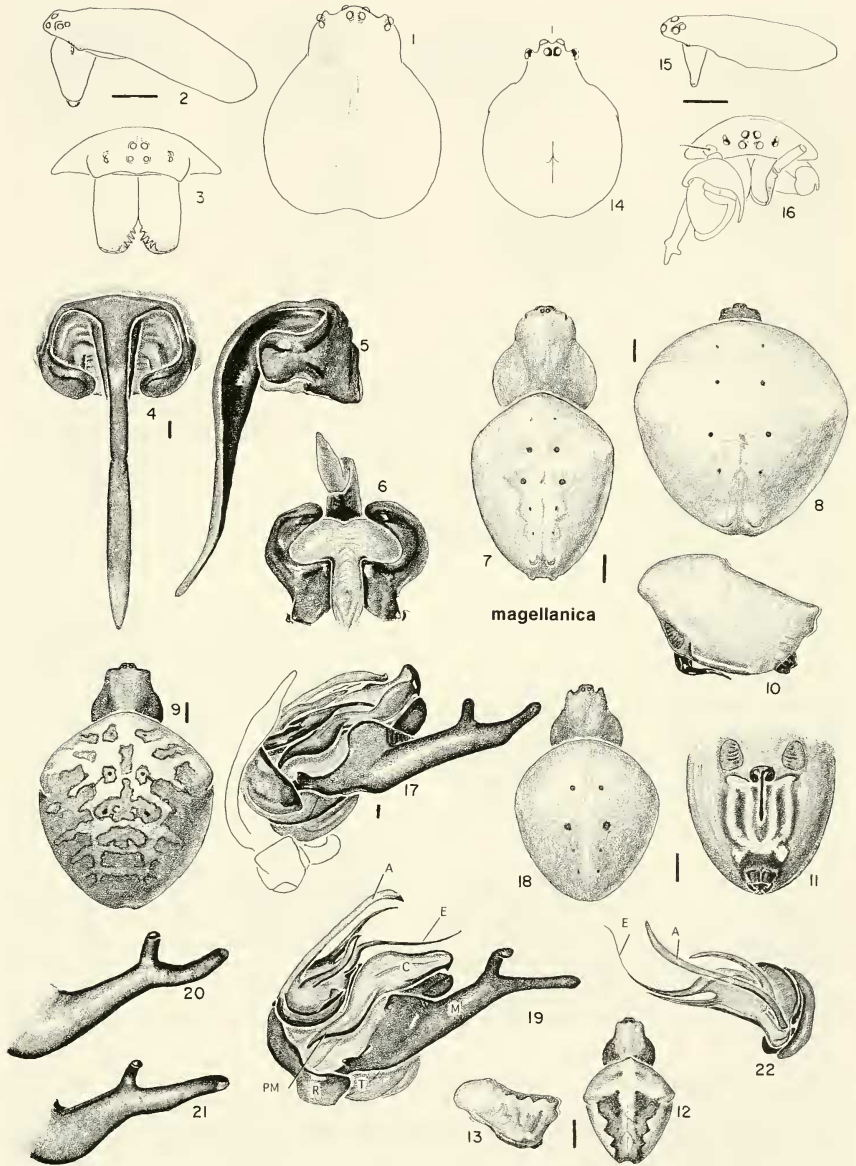
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Figures 1–22. *Molinaranea magellanica* (Walckenaer). 1–11, female. 1, carapace. 2, carapace and chelicera. 3, eye region and chelicerae. 4–6, epigynum. 4, ventral. 5, lateral. 6, posterior. 7–9, dorsal. 10, abdomen, lateral. 11, abdomen, ventral. 12, 13, immature. 12, dorsal. 13, abdomen, lateral. 14–22, male. 14, carapace. 15, carapace and chelicera. 16, eye region, chelicerae, and right palpus. 17, left palpus, mesal. 18, dorsal. 19, palpus expanded, mesal. 22, palpus expanded, lateral. 20, 21, median apophysis. 20, (Falkland Islands). 21, (Nuble, Chile).

Abbreviations: A, terminal apophysis; C, conductor; E, embolus; M, median apophysis; PM, paramedian apophysis; R, radix; T, tegulum.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.





studied males and females, but neither recognized that they belong together and that this is a widely distributed, previously described, species.

*Description.* Female from Chillan, Ñuble, Chile. Carapace dark orange (Figs. 7, 8). Chelicerae dark orange, distally brown. Labium, endites orange-brown. Sternum dark brown. Coxae orange and distal leg articles dark orange. Abdomen white dorsally (Figs. 7, 8), green when alive; venter with longitudinal dark lines interspaced by white (Fig. 11). Abdomen with a pair of dorsal tubercles. Total length 9.5 mm. Carapace 4.0 mm long, 3.7 wide in thoracic region, 2.1 behind posterior lateral eyes. First femur 4.5 mm, patella and tibia 5.8, metatarsus 3.4, tarsus 1.3. Second patella and tibia 5.7 mm, third 3.5, fourth 5.2.

Male from Las Cabras, Ñuble Prov., Chile. Coloration darker than in female (Fig. 18); carapace, sternum, coxae, legs orange-brown. Abdomen dorsum greenish white with black folium and a white cardiac patch; venter as in female (Fig. 11). Sternum with two macrosetae on posterior end. Fourth coxae each with one macroseta on one side, the other side with two (1/2), and all femora with a row of ventral macrosetae. Second tibia thicker than first, and with macrosetae. Total length 6.5 mm. Carapace 4.2 mm long, 3.1 wide in thoracic region, 1.2 behind posterior lateral eyes. First femur 3.8 mm, patella and tibia 5.3, metatarsus 3.3, tarsus 2.2. Second patella and tibia 4.6 mm, third 2.7, fourth 4.1.

*Note.* Males and females have the same ventral pattern on the abdomen (Fig. 11), and are frequently collected together.

*Variation.* Total length of females 8.0–17.5 mm, males 6.2–9.8. Immatures have the abdomen dorsum with a dark folium (Figs. 12, 13) and have the venter marked

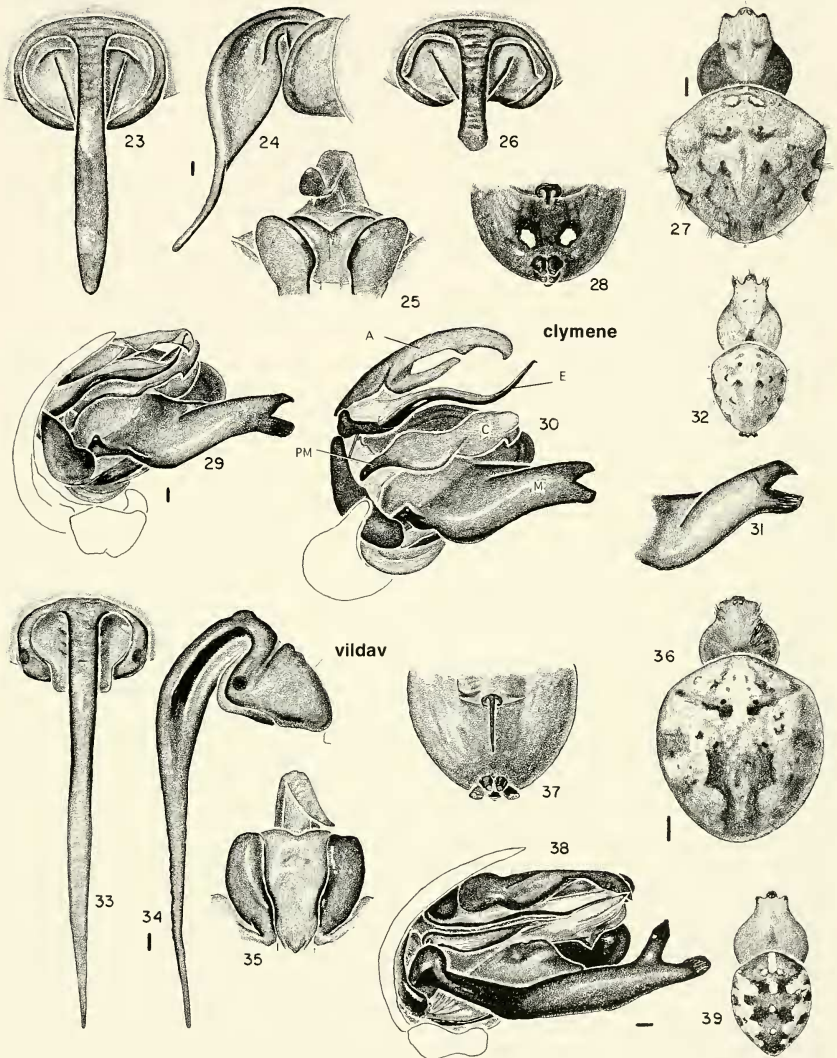
as in the adult, and posterior of abdomen with four tubercles (Fig. 13). Females may have the abdomen spotted (Nicolet, 1849, fig. 9; Fig. 9). Few adult females have a dorsal folium pattern on the abdomen, bisected by a median white band (Fig. 7). The abdomen of this species is variable in shape; some poorly fed adults may have four posterior tubercles (Fig. 7), two (Fig. 8), or none.

Of 13 males examined, only 3 (all smaller sized) had sternal macrosetae and these were in variable positions on the posterior of the sternum. Seven had 2/2 macrosetae on the fourth coxae, three had only 1/1 macroseta, and three had 1/2. All had all tarsi with a ventral line of macrosetae, but the number, size, and shape of the macrosetae was variable. For unreliable use of setae counts see Carmichael (1973).

The illustrations were made from Ñuble Province specimens, except Figure 9 from Valparaíso, Figure 18 from W Falkland Island and Figures 12 and 13 from Strait of Magellan region.

*Diagnosis.* Immatures and adults can be distinguished from other species by the five distinct black, longitudinal stripes on the underside of the abdomen, separated by four white lines (Fig. 11). The epigynum has the rim of the cavities swollen posteriorly, on each side of the scape (Fig. 4). Males have a long median apophysis with two distal prongs, the terminal longest (Figs. 17, 19, 20, 21), but both variable in shape.

*Natural History.* Found on introduced gorse bushes on Falkland Island; on fence wires at night at El Bolsón; arid coastal scrub in Coquimbo Province; forested sides of swampy brook in Mallenco Province; hotel garden in Villarrica; at 3,500–4,500 m elevation in Codillera de Iquique



Figures 33–39. *M. vildav* new species. 33–37, female. 33–35, epigynum. 33, ventral. 34, lateral. 35, posterior. 36, dorsal. 37, abdomen, ventral. 38–39, male. 38, palpus. 39, dorsal.

Abbreviations: A, terminal apophysis; C, conductor; E, embolus; M, median apophysis; PM, paramedian apophysis.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.

(unknown locality); and in burned forest in Aisén Province.

The vertical orb frequently has a vertical line stabilimentum (Plate 1C).

*Specimens Examined.* FALKLAND ISLANDS (Islas Malvinas) East Falkland Isl.: Port Darwin, Dec. Jan. 1915, 1916, 4♀ (Phillips Exped., W. S. Brooks, MCZ). West Falkland Isl.: Port Stephens, 5-7 Dec. 1915, 10♀, 1♂ (W. S. Brooks, MCZ). Fitzroy, Stanley, Nov. 1970, 2♀, 1♂ (Rumboll, MACN); West Point Island, Dec. 1971, 1♀ (Rumboll, MACN); New Island, Jan. 1972, 6♀, 2♂ (Rumboll, MACN); Stanley, Dec., 1970, 1♀ (Rumboll, MACN); Puerto San Carlos, Dec. 1971, 5♀ (Rumboll, MACN).

ARGENTINA *Nenquén*: Lago Lácar (several coll., MACN, ZMUC); Pucará, many collections (MACN); Paso del Córdoba, 1200 m, 10 Oct. 1981, 13 imm. (Nielsen, Karsholt, ZMUC); San Martín de Los Andes, 2♀ (MACN, ZMUC); Casa de Piedra, July 1970, 1♀ (MACN); Bariloche, Feb. 1954, 6♀ (M. E. Galiano, MACN); Bahúé, 20 Feb. 1968, imm. (E. Manry, MACN); Nahuel Huapi, 1960, 4♀ (N. Havrylenko, MACN). *Río Negro*: 1♀ (PAN); El Bolsón (many records, A. Kovács, AMNH); Río Azul, May 1962, 1♀, 5 Dec. 1962, 1♀ (A. Kovács, AMNH); Lago Nahuel Huapi, Puerto Blest, 770 m, 1♀ (Mision Cient. Danesa, ZMUC); SC de Bariloche, Colonia Suiza, 810 m, 20 Dec. 1978, 3♀; 27 Sept. 1981, 1♀ (Mision Cient. Danesa, ZMUC); Lago Frio, 1♀ (MLP); Balmaceda, 27 Jan. 1957, 2♀ (M. Podocco, MACN); Estancia San Ramón, Río Lámar, Rincón Chico, Jan. 1962, 2♀, 1♂ (N. Havrylenko, MACN). *Chubut*: Lago Puelo, El Bolsón, many records (AMNH, ZMUC); El Mañten, 2 Feb. 1966, 1♀; Hoyo de Epuyén, 1958, 2♀; 17 Oct. 1966, 1♀, 1♂; Río Turbio, 12 Jan. 1962, 1♀ (all A. Kovács, AMNH). *Santa Cruz*: Valle Eléctrico, 10-15 Feb. 1949, 1♀ (N. O. Gianolini, MACN). *Tierra del Fuego*: Río Grande, Nov. 1973, 3 imm. (MACN); Estancia Harberton, 25 Jan. 1979, 1♀ (Mision Cient. Danesa, ZMUC); Bahía Aguirre, 12 Nov. 1949, 1♀ (Núñez-Patridge, MACN); Beagle Canal, 1882-1883, 1♀ (Mission du Cap Horn, MNHN). *CHILE Islas Juan Fernández*: Más Afuera, 12 Dec. 1970, 1♀ (O. Solbrig, MCZ); Santa Cruz (MNHN). Very common from about 30° latitude south to Tierra del Fuego.

### *Molinaranea clymene* (Nicolet)

Plate 1A: Figures 23-32; Map 1B

*Epeira clymene* Nicolet, 1849: 503. Described from Chile. Female holotype in MNHN, lost.

*Epeira thalia* Nicolet, 1849: 503. Described from Chile. Synonymized by Simon, 1904: 95.

*Epeira nigrata* Nicolet, 1849: 504. Described from Chile. Synonymized by Simon, 1904: 95.

*Epeira inflata* Nicolet, 1849: 504. Described from Valdivia, Chile. Synonymized by Simon, 1904: 95.

*Epeira erudita* Nicolet, 1849: 505. Described from Chile. Synonymized by Simon, 1904: 95.

*Epeira hispida* Nicolet, 1849: 505. Described from Chile. Synonymized by Simon, 1904: 95.

*Epeira valdiviensis* Nicolet, 1849: 506. Described from Valdivia. NEW SYNONYMY.

*Araneus clymene*:—Simon, 1895: 802. Simon, 1904: 95. Bonnet, 1955: 461.

*Araneus aysenensis* Tullgren, 1902: 32, pl. 3, fig. 4, ♀. Three ♀ syntypes from upper Aysen Valley (Aisén Valley, Coyhaique), Chile in NRMS, examined. Synonymized with *E. clymene* by Simon, 1904: 95.

*Aranea aysenensis*:—Roewer, 1942: 837.

*Aranea valdiviensis*:—Roewer, 1942: 855.

*Aranea clymene*:—Roewer, 1942: 839.

*Araneus valdiviensis*:—Bonnet, 1955: 626.

*Ata erudita*:—Archer, 1963: 27.

*Note.* Simon (1904) did not give reasons for his synonymies. Petrunkevitch (1911) and Roewer (1942) either overlooked or did not accept his synonymy of *aysenensis*. A female in the MNHN, 18529, from Tierra del Fuego, is labeled by Simon as *clymene*. *Epeira erudita* and *E. valdiviensis* have large white patches on the underside of the abdomen, diagnostic for this species. Of all these names only *A. aysenensis* is adequately described and illustrated. However, I will follow the first reviser, Simon (1904), in the use of the old names.

*Description.* Female from Concepción Prov., Chile. Carapace light brown with two dark spots on cephalic region, sides of carapace brown (Fig. 27). Chelicerae light brown. Labium, endites light brown. Sternum brown. Coxae light brown, distal leg articles brown with rings indistinctly darker. Abdomen brown, subspherical with a pair of anterior humps (Fig. 27), brown in living individuals. Abdomen with scattered bundles of projecting, white setae (Fig. 27). Abdomen with dorsal folium (Fig. 27), venter black with a pair of prominent white spots (Plate 1A, Fig. 28). Total length 13.0 mm. Carapace 7.0 mm long, 6.1 wide in thoracic region, 3.5 wide in cephalic region. First femur 7.1 mm, patella and tibia 8.2, metatarsus 5.5, tarsus 2.0. Second patella and tibia 7.2 mm, third 5.0, fourth 7.5.

Male. Coloration slightly darker than in

female. Sternum with two macrosetae on posterior tip. Abdomen with bundles of white setae (Fig. 32). Fourth coxae with two macrosetae. All femora with ventral, paired rows of macrosetae. Total length 9.5 mm. Carapace 4.9 mm long, 3.9 mm wide in thoracic region, 2.0 mm wide behind posterior lateral eyes. First femur 5.5 mm, patella and tibia 6.9, metatarsus 4.7, tarsus 1.9. Second patella and tibia 5.8 mm, third 3.5, fourth 5.0.

*Note.* Males and females were matched on the basis of the prominent, ventral pair of white spots on the abdomen in both sexes, and the abdomen covered by tufts of white setae.

*Variation.* Total length of females 9.5–18 mm, males 7.5–9.8 mm. Photographs of females taken in Valdivia had the abdomen brown, with very distinct white tufts of setae, a lateral wavy margin separating a much darker side. It is common to find females with the epigynal scape broken off (Fig. 26). The illustrations were made from a female from Concepción, and Figure 27 from several specimens and the male from Osorno.

*Diagnosis.* Females and males can be separated from other species by the pair of white marks on the venter of the abdomen (Fig. 28) and by the bundles of white setae scattered over the abdomen (Figs. 27, 32). Each of the cavities of the base of the epigynum contains a longitudinal, diagonal fold, farthest apart anteriorly, closest together posteriorly (Figs. 23, 26). The rim lacks the swollen posterior region on each side of the scape (Figs. 23, 26), present in *M. magellanica* (Fig. 4). The palpus has a distinctly shaped conductor (at 1:00 in Fig. 29, C in Fig. 30), and the median apophysis has shorter prongs (Figs. 29–31) than those of *M. magellanica* (Figs. 20, 21).

*Natural History.* Specimens have been collected from a Malaise trap in *Nothofagus* forest in Puyehue, on wet stream bank south of Chaiten, in mixed and wet forest, and in virgin forests in several areas. None

of the observed webs had a stabilimentum (Piel, personal communication.)

*Specimens Examined.* ARGENTINA Río Negro: Lago Nahuel Huapi, Puerto Blest, 15 Nov. 1997, 1 ♀ (Mision Cient. Danesa, ZMUC). *Chubut*: Puerto Blest, 1–6 Jan. 1982, 1 ♀ (Nielsen, Karsholt, ZMUC). CHILE *Cochinbo*: Elqui, July 1960, 54 imm. (L. Peña, IRSNB). *Aconcagua*: Choapa, E of La Ligua, 27 Sept. 1980, 2 ♀ (L. Peña, AMNH), in the north. Very common, south of the Aisén Valley.

### *Molinaranea vildav* new species

Figures 33–39; Map 1C

*Epcira diadema*.—Nicolet, 1849: 459. Not *Epcira diadema* Walckenaer [= *Araneus diadematus* (Clerck)], erroneous determination.

*Holotype.* Female holotype, from Valdivia, Prov. Valdivia, Chile, 15–20 Nov. 1978 (E. Krahmer), in AMNH. The specific name is an arbitrary combination of letters.

*Note.* Some individuals of this species have a color pattern on the back of the abdomen resembling that of the European *Araneus diadematus* (Figs. 36, 39). Nicolet also noticed the unusually long scape in his Chilean specimens.

*Description.* Female holotype. Carapace dark orange-brown with white setae (Fig. 36). Chelicerae, labium, endites brown. Sternum orange-brown. Coxae and distal leg articles brown with wide, darker rings. Abdomen dorsum with folium marks, white and brown (Figs. 36, 39); venter gray without distinct marks (Fig. 37). Abdomen spherical with anterior, dorsal pair of humps (Fig. 36). Total length 11 mm. Carapace 3.9 mm long, 3.6 mm wide in thoracic region, 2.1 mm wide in cephalic region. First femur 4.0 mm, patella and tibia 4.6, metatarsus 3.1, tarsus 1.2. Second patella and tibia 4.1 mm, third 2.8, fourth 4.1.

Male from Valdivia, Chile. Coloration as in female but darker (Fig. 39), venter of abdomen black without marks (Fig. 37). Fourth coxae with two macrosetae. Venter of first femur with three macrosetae, third and fourth with a line of ventral macrosetae. Second tibia thicker than first. Abdomen shield-shaped (Fig. 39). Total length 7.4 mm. Carapace 3.9 mm long, 3.7 mm wide, 1.6 mm wide behind lateral eyes. First

femur 3.7 mm, patella and tibia 5.0, metatarsus 3.1, tarsus 1.3. Second patella and tibia 4.3 mm, third 3.7, fourth 2.8.

*Note.* Males and females were collected together.

*Variation.* Total length of females 7.8–11.0 mm. Illustrations were made from the female holotype and male allotype.

*Diagnosis.* *Molinaranea vildav* resembles *M. magellanica* and *M. clymene* in the large size and oval abdomen but can be separated by the unicolorous gray venter of the abdomen. In *M. magellanica* the length of the scape projecting beyond the base is about 1.5 times the width of the base (Fig. 4), overhanging length of *M. vildav* scape is more than twice the width of its base (Fig. 33). The scape may extend to the spinnerets (Fig. 37). Unlike the epigynum of the two other species, the posterior median plate is longer than wide with sides almost parallel (center of Fig. 35). The male palpus has the proximal end of the median apophysis with a lobe above the radix and its two terminal prongs are of equal length (Fig. 38); that of *magellanica* has a tooth above the radix and the "lower" prong is longer than the "upper" one (Fig. 19).

*Natural History.* No data is included on collecting labels.

*Specimens Examined.* CHILE *Nuble*: 4 km E Pinto, 5 Jan. 1976, 1♂ (G. Moreno, MCZ). *Malleco*: Sierra Nahuelbuta, 1200 m, W Angol, 23 Jan. 1951, 1♀ (E. S. Ross, A. E. Michellbacher, CAS). *Valdivia*: Valdivia, 8 Dec. 1976, 1♀, 1♂ (E. Krahmer, AMNH).

### *Molinaranea fernandez* new species

Figures 40–47; Map 1C

*Holotype.* Female holotype, male allotype, and one female paratype, one male and five immature paratypes from Juan Fernandez Islands, Chile, Mas a Tierra, Valle Anson, Plazoleta de Yunque, 200–250 m, Camote side, 1–28 April 1962 (Boris Malkin), in AMNH. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace orange-brown (Fig. 43). Chelicerae, labium, endites, sternum orange. Coxae and distal leg articles orange-brown, with indistinct darker rings. Black line between

tips of abdominal tubercles, fading anteriorly, and cut off posteriorly (Fig. 43); venter with indistinct, white square, but no dark markings (Fig. 44). Abdomen subspherical, with a pair tubercles (Fig. 43). Total length 10 mm. Carapace 4.5 mm long, 3.8 wide in thoracic region, 2.3 wide behind posterior lateral eyes. First femur 4.4 mm, patella and tibia 5.4, metatarsus 3.5, tarsus 1.0. Second patella and tibia 4.7 mm, third 2.9, fourth 4.2

Male allotype. Coloration as in female. Abdomen as in female (Fig. 47). Ventrally all femora have a double row of short macrosetae. Total length 7.8 mm. Carapace 4.2 mm long, 3.4 wide in thoracic region, 1.7 wide behind posterior lateral eyes. First femur 4.5 mm, patella and tibia 5.6, metatarsus 4.5, tarsus 1.4. Second patella and tibia 4.8 mm, third 2.7, fourth 3.7.

*Note.* One of the two males has posterior median eyes that, without staining or dissections, show the parallel rows of cells abutting the canoe-shaped tapetum. Males and females were collected together and have similar distinct coloration.

*Diagnosis.* *Molinaranea fernandez* differs from other species by having a distinct transverse dark line between the tubercles of the abdomen, fading out anteriorly and cut off posteriorly (Fig. 43). Unlike other species (except *M. magellanica*), *M. fernandez* has the posterior median plate of the epigynum T-shaped (Fig. 42). The shape of the median apophysis and its prongs, the "upper" one longer than the "lower" one, distinguishes the palpus (Figs. 45, 46). The embolus is embedded in the conductor (at 1:00 in Fig. 45).

*Specimens Examined.* No other specimens were found.

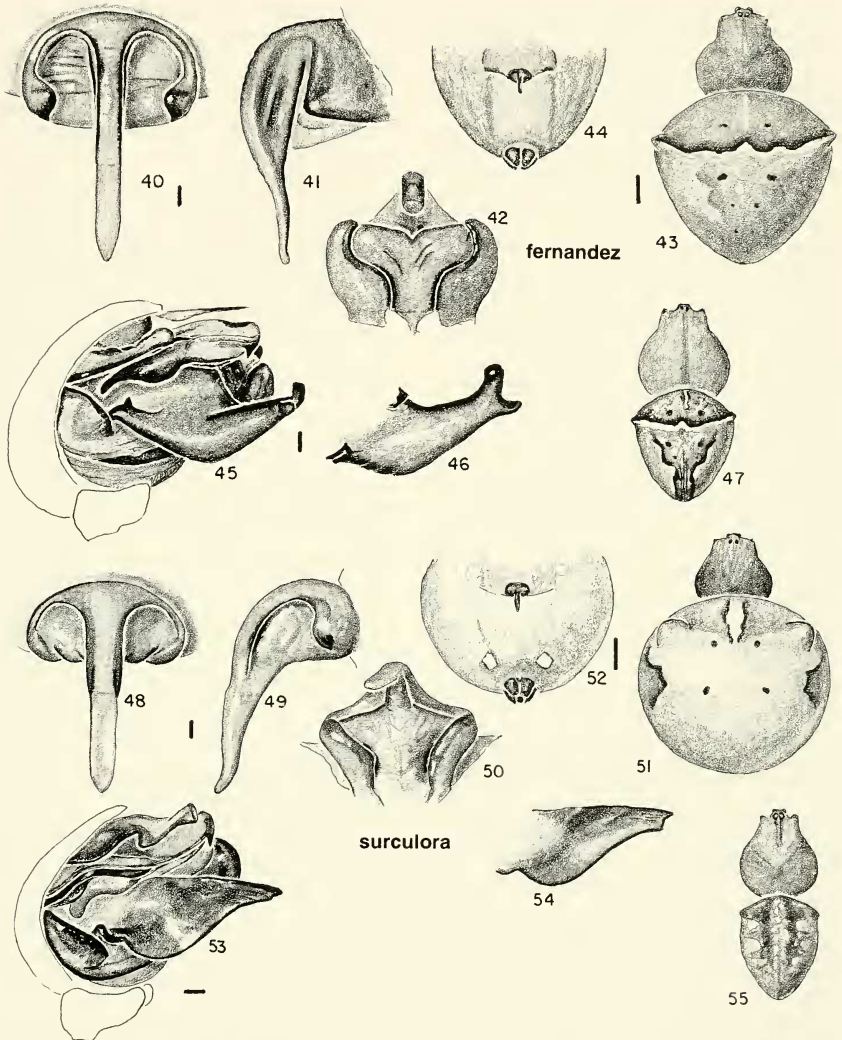
### *Molinaranea surculora* (Simon)

Figures 48–55; Map 1D

*Araneus surculorum* Simon, 1896: 67. Female holotype from Sierra de Chillán [Nuble Prov.], Chile, in MNHN, examined. Simon, 1904: 96. Bonnet, 1955: 605.

*Aranea surculorum*.—Roewer, 1942: 853.

*Description.* Female from Valdivia,



Figures 40-47. *Molinaranea fernandez* new species. 40-44, female. 40-42, epigynum. 40, ventral. 41, lateral. 42, posterior. 43, dorsal. 44, abdomen, ventral. 45-47, male. 45, left palpus. 46, median apophysis. 47, dorsal.

Figures 48-55. *M. surculora* (Simon). 48-52, female. 48-50, epigynum. 48, ventral. 49, lateral. 50, posterior. 51, dorsal. 52, abdomen, ventral. 53-55, male. 53, palpus. 54, median apophysis. 55, dorsal.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.

Chile. Carapace orange, darkest around border, lightest on anterior half of cephalic region, with many setae. Chelicerae light orange, darker distally. Labium, endites brown. Sternum brown. Coxae light orange; legs brown with indistinct dark rings. Dorsum of abdomen light grayish brown, framed by gray and black margin (Fig. 51); venter slightly dusky between epigynum and spinnerets with a pair of small white pigment spots close to spinnerets (Fig. 52). Abdomen wider than long, anteriorly with a pair of round tubercles (Fig. 51). Total length 7.2 mm. Carapace 3.0 mm long, 2.3 wide in thoracic region, 1.5 wide behind posterior lateral eyes. First femur 2.6 mm, patella and tibia 3.3, metatarsus 2.2, tarsus 1.0. Second patella and tibia 3.3 mm, third 2.1, fourth 3.0.

Male from Valdivia, Chile. Carapace dark orange, anterior of cephalic region lightest. Chelicerae dusky yellow. Labium, endites brown. Sternum dusky brown. Coxae dusky orange, legs brown, indistinctly ringed. Dorsum of abdomen with brown folium (Fig. 55); venter black with pairs of indistinct white spots. Second tibia thicker than first, with prolateral macrosetae. Venter of fourth femur with three macrosetae; others bare. Abdomen longer than wide, with a pair of anterior tubercles (Fig. 55). Total length 5.9 mm. Carapace 3.0 mm long, 2.5 wide in thoracic region, 1.4 wide behind posterior lateral eyes. First femur 2.5 mm, patella and tibia 3.5, metatarsus 2.2, tarsus 0.9. Second patella and tibia 3.2 mm, third 1.8, fourth 2.7.

*Note.* Males and females were collected together.

*Variation.* Total length of females 5.9–8.8 mm, males 4.3–6.1. Males may have macrosetae on the venter of the third femora. The epigynum illustrated came from a female from Ñuble, the male and female abdomen were from Valdivia, and the palpus was from a specimen from Osorno.

*Diagnosis.* Immatures can be separated from other species by the wider than long abdomen bearing a pair of tubercles and a dark patch on each side (Fig. 51). In pos-

terior view the epigynum differs from others by the raised septum in the depression between scape and posterior median plate (at 12:00 in Fig. 50). The male differs by the wide, triangular, flat median apophysis having only two small tubercles in place of prongs (Figs. 53, 54).

*Natural History.* One collecting label records forest as the habitat.

*Specimens Examined.* CHILE *Limari:* Nague, 20 Sept. 1980, 1♀ (L. E. Peña, AMNH). *Acoucagua:* Zapallar, 27 Nov. 1950, 2♀, 1♂ (E. S. Ross, A. E. Michelbacher, CAS). *Valparaíso:* Valparaíso, 22 Dec. 1973, 1♀ (W. C. Sedgwick, MCZ). *Santiago:* Malleco, Nov. 1979, 1♀ (L. Peña, AMNH). *Curicó:* El Coigo, 1–10 Oct. 1960, ♂ (L. Peña, IRSNB). *Ñuble:* 40 km E San Carlos, 24 Dec. 1950, 1♀ (E. S. Ross, A. E. Michelbacher, CAS); Las Cabras, Dec. 1986, 7♀, 2♂ (L. Umaña, AMNH); Los Lluquenes, 5–20 Dec. 1985, 6♀ (L. Umaña, AMNH); Cobquecura, 12–14 Feb. 1950, 2♀ (L. E. Peña, IRSNB). *Malleco:* Contulmo, 1909, 1♀ (E. Reimoser, MCZ); El Manzano, nr. Contulmo, 15 Dec. 1985, 1♀, 1♂ (L. E. Peña, AMNH); Nahuelbuta Natl. Park, 12 Oct. 1976, 5♀ (L. E. Peña, AMNH); Sierra Anahuelluta, W Angol, 1200 m, 23 Jan. 1951, 1♀ (E. S. Ross, A. E. Michelbacher, CAS). *Valdivia:* Santo Domingo, 19 Sep. 1976, 2♂ (E. Kramer, AMNH); Valdivia, 12 Oct. 1976, 5♀, 2♂; S Dec. 1976, 1♀ (E. Kramer, AMNH, MCZ); Purofón, NW Panguipulli, 10 Jan. 1985, 1♂ (L. E. Peña, AMNH). *Osorno:* Pucatrihue, coast, Jan.–Mar. 1968, 2♀, 1♂ (L. E. Peña, AMNH, MCZ); Pucatrihue, 1–10 Feb. 1980, 1♀ (L. E. Peña, AMNH). *Llanquihue:* Lago Chapo, Dec. 1968, 1♀ (L. E. Peña, MCZ); Los Muermos, 19 Jan. 1951, 1♀ (E. S. Ross, A. E. Michelbacher, CAS).

### *Molinaraea phaethontis* (Simon) Figures 56–65; Map 1E

*Araucos phaethontis* Simon 1896: 67. Female holotype from Sierra de Chillán, [Ñuble Prov.], Chile (MNHN), examined. Bonnet, 1955: 565.  
*Arauca phaethontis:* Roewer, 1942: 67.

*Description.* Female from Valdivia, Chile. Carapace light brown, darkest in center (Fig. 59). Chelicerae, labium, endites, sternum light brown. Coxae, legs light brown, distal leg articles ringed with brown. Abdomen with median, longitudinal, light line flanked by a pair of dark bands, and a light folium posteriorly (Fig. 59); venter with indistinct median, square white patch (Fig. 60). Abdomen with a pair of elongate, dorsal tubercles and a



median posterior extension (Figs. 59–61). Total length 7.5 mm. Carapace 2.5 mm long, 2.2 wide in thoracic region, 1.3 wide in cephalic region. First femur 2.5 mm, patella and tibia 3.0, metatarsus 1.8, tarsus 0.7. Second patella and tibia 2.8 mm, third 1.7, fourth 2.5.

Male from Talca Prov., Chile. Carapace, chelicerae, labium, endites, sternum light brown. Eye region without black pigment. Coxae, legs light brown without dark rings. Dorsum of abdomen with a dark folium (Fig. 64); venter with pair of white patches and a pair of white spots adjacent to the spinnerets (Fig. 65). Fourth coxa with one macroseta. Second tibia thinner than first, with few macrosetae. Abdomen oval (Fig. 64). Total length 5.3 mm. Carapace 2.3 mm long, 2.0 wide, 0.9 wide behind lateral eyes. First femur 2.6 mm, patella and tibia 3.5, metatarsus 2.0, tarsus 0.9. Second patella and tibia 2.9 mm, third 1.7, fourth 2.5.

*Note.* Males and females were matched by elimination and by their similar coloration.

*Variation.* Total length of females 5.5–8.2 mm, males 5.3–5.7. Illustrations were made from a female from Valdivia and male from Talca.

*Diagnosis.* Females and immatures may be distinguished from others by the shape of the abdomen, elongate with two long, pointed tubercles (Figs. 59, 61). Females are also distinguished by having a constriction of the scape (Fig. 56). The male can be distinguished from other *Molinarana* by having the “upper” prong of the median apophysis longer than the “lower” one (Figs. 62, 63), and from *M. fernandez* by the curved tip of the embolus (left of tooth at 1:00 of Fig. 62).

*Specimens Examined.* ARGENTINA *Neuquén:* Lago Lacar, Pucará, 10 Nov. 1978, 1♂ (Mision Cient. Danesa, ZNIUC). CHILE *Metropolitana:* El Manzano, Santiago, 13 Oct. 1982, 1♂ (L. E. Peña, AMNH). *Talca:* Andes at Alto de Vilches, 17–24 Oct. 1964, 1♂ (L. Peña, MCZ). *Malleco:* Malalcahuello, 9–15 Dec. 1985, 2♀ (L. E. Peña, AMNH). *Valdivia:* Valdivia, 12 Oct. 1976, 2♀ (E. Krahmer, MCZ).

### *Molinarana mammifera* (Tullgren) new combination

Figures 66–73; Map 1F

*Arancus mammiferus* Tullgren, 1902: 34, pl. 3, fig. 5, ♀. Three female syntypes and 10 female paratypes from upper and lower Aysen Valley, [Prov. Aisén], Chile in the NRMS, examined.

*Arancus mammifera*:—Roewer, 1942: 846.

*Arancus mammifer*:—Bonnet, 1955: 533.

*Lariniacantha mammifera*:—Archer, 1963: 26.

*Note.* Bonnet changed the adjective *mammiferus* to a noun *mammifer* because it had two m's; the adjective has only one m, the noun has two. This is an unacceptable emendation.

*Description.* Female syntype. Carapace orange-brown with white setae (Fig. 69). Chelicerae brown with orange. Labium, endites brown. Sternum dark brown. Coxae light orange; distal leg articles ringed brown on orange. Abdomen with contrasting dark folium (Fig. 69); venter with a pair of white spots on black, black area with three anterior extensions (Fig. 70). Abdomen elongate with a pair of dorsal humps (Fig. 69). Total length 6.8 mm. Carapace 2.4 mm long, 2.0 wide in thoracic region, 1.2 wide behind posterior lateral eyes. First femur 2.7 mm, patella and tibia 3.1, metatarsus 2.0, tarsus 1.0. Second patella and tibia 2.7 mm, third 1.6, fourth 2.5.

Male allotype. Coloration as in female. Abdomen as in female (Fig. 73). Total length 4.6 mm. Sternum, coxae without macrosetae. Third and fourth femora with line of macrosetae on ventral surface. Carapace 2.4 mm long, 1.8 wide in thoracic region, 0.9 wide behind posterior lateral eyes. First femur 3.1 mm, patella and tibia 3.6, metatarsus 2.5, tarsus 2.2. Second patella and tibia 3.0 mm, third 1.8, fourth 2.4.

*Note.* Males and females were matched on the basis of the similar elongate abdomen (Figs. 69, 73).

*Variation.* Total length of females 5.8–8.0 mm, males 4.2–5.0. The illustrations were made from a female paratype, and the male from Villarica.

*Diagnosis.* Immatures can be distinguished from other species by the elongate shape of the abdomen (Fig. 69) with a pair of white spots on the black venter, close to the spinnerets (Fig. 70). Adult females can be separated by the short scape of the epigynum, not extending beyond the posterior of the base (Figs. 66, 67). The palpus of the male differs by the wide U-shaped conductor, (a C lying on its left side in Fig. 71) and the short, wide median apophysis (Figs. 71, 72).

*Natural History.* Specimens have been found in Valdivian rain forest, by sweeping at dusk at Osorno, in forest in Puyehue, in mixed forest litter in Cautín, and in wet forest in Aisén.

*Specimens Examined.* CHILE *Concepción:* Ramincho, 22 Mar. 1975, 1♀ (T. Cekalovic, MCZ); Hualpen, 3 Nov. 1975, 1♀ (T. Cekalovic, AMNH). *Malleco:* Angol, Cordillera Nahuelbuta, 14–24 Feb. 1977, 1♀ (G. Moreno, AMNH). *Cautín:* 30 km NE Villarrica, Jan. 1965, 1♂ (L. Peña, MCZ); Temuco Cerro Nielo Natl. Park, 300 m, 13 Dec. 1984, 1♀ (S., J. Peck, AMNH). *Valdivia:* 30 km W La Unión, 7–11 Feb. 1988, 1♀ (C. B. Edwards, FSCA). *Osorno:* Termas de Puyehue, 10 Mar. 1965, 1♂ (H. Levi, MCZ); 19–25 Dec. 1982, 1♂ (A. Newton, M. Thayer, AMNH); Parque Nacional Puyehue, 4.1 km E Anticura, 430 m, 19–26 Dec. 1982, 1♂ (A. Newton, M. Thayer, AMNH); Aguas Calientes, Parque Nacional Puyehue, 31 Jan. 1985, 1♀ (N. Platnick, O. Francke, AMNH). *Chiloé:* Chaitén, 1–100 m, 4 Dec. 1981, 1♀ (N. Platnick, R. Schuh, AMNH). *Aisén:* Parque Nacional Río Simpson, 22 km E Aisén, 5 Feb. 1985, 1♀ (N. Platnick, O. Francke, AMNH).

### *Nicolepeira* new genus

*Type species.* *Epeira flavifrons* Nicolet, 1849. The name is an arbitrary combination of letters linking part of author Nicolet's name with epeira. The generic name *Nicolepeira* is feminine.

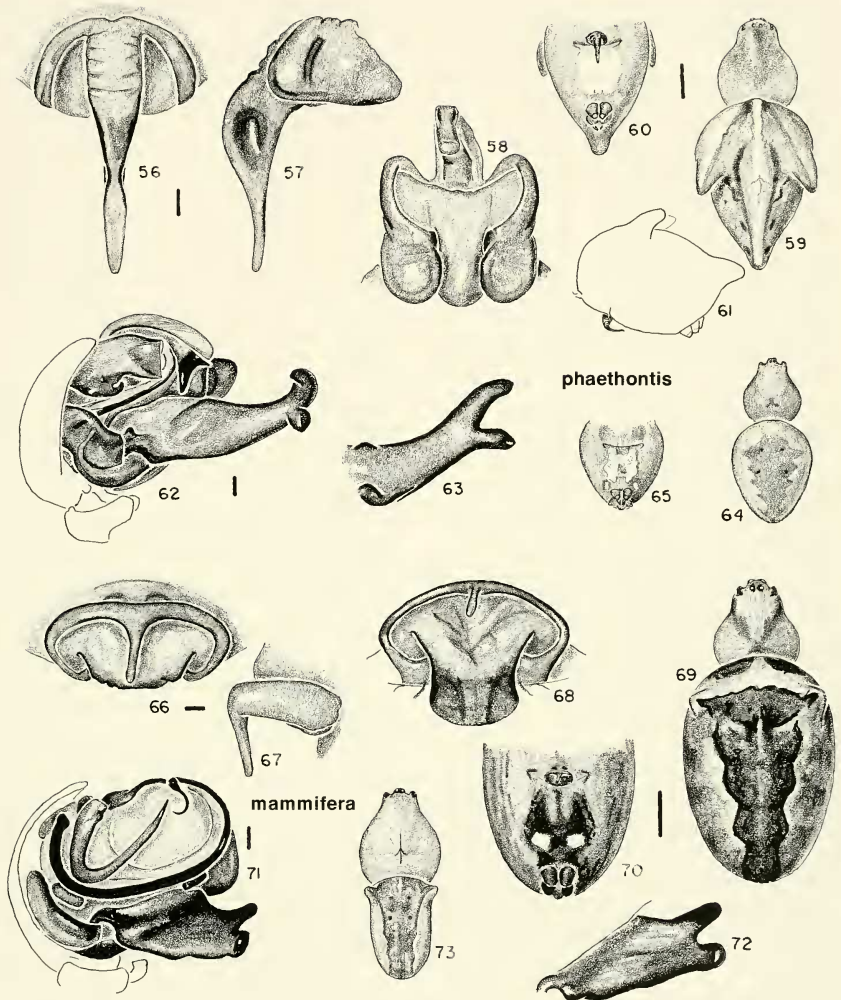
*Diagnosis.* The male palpus, unlike that of males of other araneid genera, has a large conductor (C) that covers about one fifth to one third of the bulb, giving the palpus an unusual appearance for an araneid (Figs. 87, 88, 98, 99, 111, 112). Although the conductor is attached in the center of the tegulum, it shows prominently on the lateral side of the palpus (Figs. 88, 99, 112). As in the palpi of *Acaecia*, *Micrathena*, and *Zygiella* species,

but unlike most other araneid palpi, the *Nicolepeira* palpus has a modified sculptured paracymbium (P in Fig. 90; Figs. 88, 89, 99, 112). The epigynum is also unusual for an araneid. Of the three species two have a septum separating paired depressions, with the septum continuing posteriorly into the median posterior plate (Figs. 77, 78, 101, 102). The third species, *Nicolepeira transversalis*, has no septum but has a median soft area bordered posteriorly by the posterior median plate. In two of the species the soft abdomen has tubercles in unusual places for Araneidae (Figs. 79–82, 105–108). The third species has an *Araneus*-like spherical to triangular abdomen (Figs. 94–96) with a pair of anterior, dorsal humps.

*Singa* and *Hypososinga* might be confused with *Nicolepeira* because of their superficially similar genitalia, but *Singa* and *Hypososinga* have a shiny, oval, longer than wide abdomen, and are found in the north temperate area, not in South America. The similarities are probably homoplasies.

*Description.* Females. Small, less than 6 mm in total length, thoracic region of carapace less than 1.6 mm wide. Cephalic region of carapace almost as wide as thoracic region (Figs. 74, 76). Eyes subequal or posterior median eyes slightly larger than anterior medians. Anterior median eyes separated by a distance of 1.5 diameters, and 2–4 diameters from laterals. Posterior median eyes separated by a distance of 1–1.5 diameters, 3–4 diameters from the laterals. Median eyes form a square. Height of clypeus about equal to diameter of anterior median eye. Abdomen soft. In *Nicolepeira transversalis* the abdomen is *Araneus*-like (Figs. 95, 96), in *flavifrons* it is wider than long with two or more anterior lateral tubercles (Figs. 79–82), in *bicaudata* it is longer than wide with two pairs of posterior lateral tubercles (Figs. 105–108). In all three species the shape of the abdomen is variable among individuals (Figs. 79–81, 94, 95, 105–110).

Males. Width of carapace equals that of female. Total length less because of small



Figures 56-65. *Molinaranea phaethontis* (Simon). 56-61, female. 56-58, epigynum. 56, ventral. 57, lateral. 58, posterior. 59, dorsal. 60, abdomen, ventral. 61, abdomen, lateral. 62-65, male. 62, left palpus. 63, median apophysis. 64, dorsal. 65, abdomen, ventral.

Figures 66-73. *M. mammifera* (Tullgren). 66-70, female. 66-68, epigynum. 66, ventral. 67, lateral. 68, posterior. 69, dorsal. 70, abdomen, ventral. 71-73, male. 71, palpus. 72, median apophysis. 73, dorsal.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.

abdomen (Figs. 106, 113). Cephalic region of carapace wider than half the width of thoracic region (Figs. 83, 85). Eyes subequal or posterior median eyes slightly larger than anterior medians. Anterior median eyes separated by a distance of 1.3–1.5 diameters and 2–5 diameters from laterals. Posterior median eyes separated by a distance of 1–2.2 diameters, 3–5 diameters from laterals (Fig. 83). Height of clypeus about one diameter or less of anterior median eye (Fig. 85). Endite tooth present (at 4:00 in Fig. 85), reduced in *N. transversalis*. Palpal patella with one macroseta (Fig. 85), except no macroseta in *N. transversalis*. No hook on first coxa, no groove on second femur. Second tibia may be thinner than first.

**Genitalia.** The epigyna lack a scape but may have a flat septum separating the two sides (Figs. 77, 78, 101, 102), or the septum may be lacking (Figs. 91, 92).

The large conductor (C) of the male palpus (Fig. 90) is attached in the middle of the tegulum as in genera in which the palpus has a paramedian apophysis, *Paravixia*, and *Molinaranea*. An unusual, extra sclerite above the radix in *N. flavifrons* (PM center of Fig. 90, at 10:00 in Fig. 87), although it does not have the usual shape of the paramedian apophysis, is probably its homolog.

**Relationship.** In *N. bicaudata* the abdomen has a laterally biforked posterior end (Fig. 106), as is otherwise found in the American representative of *Molinaranea* (Fig. 8), in *Allocyclosa* (Levi, 1999, fig. 13), *Cyrtophora* (Levi, 1997, fig. 152), and in *Paravixia chubut* (Fig. 117). The biforked tail may be a synapomorphy with *Allocyclosa*, most likely a homoplasy of *Cyrtophora*.

The carapace shape (Figs. 74, 83) is most like that of *Paravixia* (Levi, 1992, figs. 1, 3) probably a synapomorphy.

The septum found in the epigynum (Figs. 77, 78, 101, 102) resembles the scape of *Cyclosa* (Levi, 1999, figs. 31–33). The structure has been lost in *N. trans-*

*versalis* (Fig. 91) and independently in *Allocyclosa bifurca* (Levi, 1999, fig. 6).

The large conductor (C) embedding an embolic filament (E) (Fig. 90) is probably a synapomorphy with the similar-sized conductor of *Cyclosa* (Levi, 1999, fig. 39). The shape of the sclerite considered the paramedian apophysis (PM in Fig. 90) is most similar in outline to the bar-shaped tip of the *Cyclosa* paramedian apophysis (Levi, 1999, figs. 39, 330), probably a synapomorphy. In *Cyclosa* the median apophysis is partly underneath the conductor (Levi, 1999, M in fig. 39); in *N. flavifrons* the median apophysis is pushed "down" by the conductor (Figs. 88, 90).

The palpi of *Nicolepeira* have an uncommon, sculptured paracymbium (4:00 in Fig. 88, 89; P in Fig. 90). A sculptured paracymbium is found also in *Zygiella* (Fig. 131), *Micrathena* (Levi, 1985, P in fig. 9) and some other araneid genera. I consider these structures homoplasies because, based on other characters, the genera are not related.

The similar cone-shaped palpal tibia of *N. transversalis* (Figs. 98, 99) and *Zygiella* (Figs. 129, 130) are plesiomorphies.

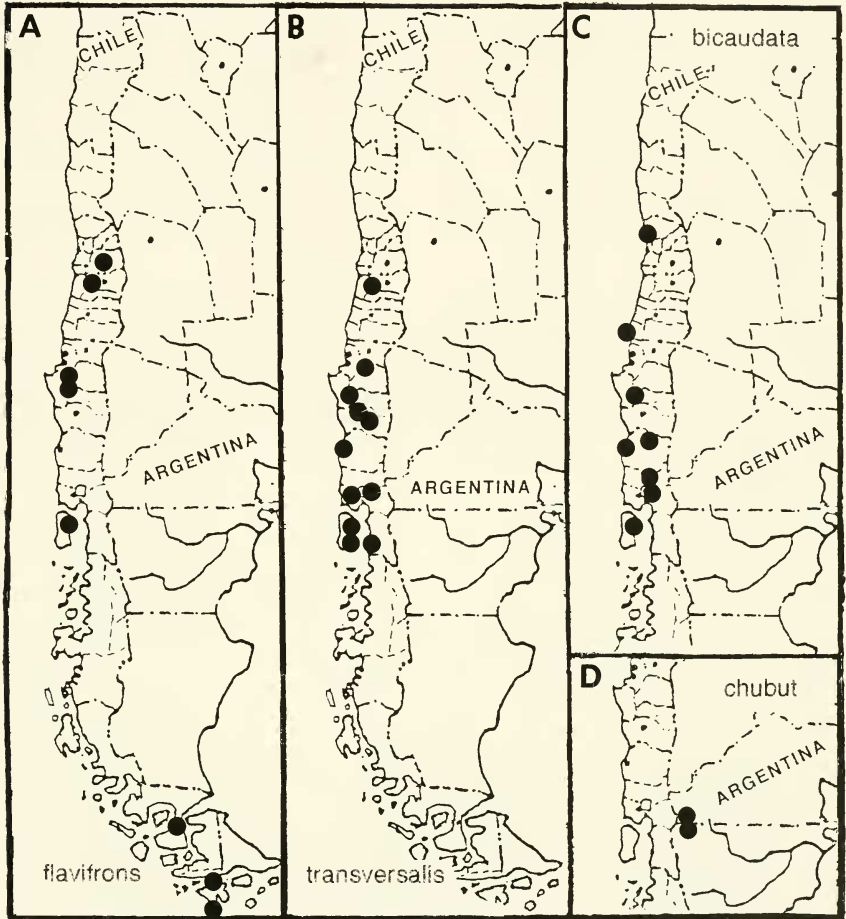
**Natural History.** Nothing is known of the habits of the three species, except that they are found in shrubby vegetation in woods.

**Distribution.** Only three species are known, all limited to Chile.

**Separating Species.** All three species have distinct genitalia and also a variable but distinct shape of the abdomen.

#### KEYS TO THE SPECIES OF NICOLEPEIRA

1. Abdomen usually longer than wide with posterior end forked (Figs. 105–110, 113); male palpus with coiled conductor as in Figures 111 and 112 ..... *bicaudata*
- Abdomen as wide as long (Figs. 95, 100) or wider than long (Figs. 80, 86); conductor curved (Figs. 87, 98, 99) ..... 2
- 2(1). Abdomen triangular to spherical, as wide as long, with one pair of dorsal humps (Figs. 94–96); epigynum without a septum (Fig. 91); palpus as in Figures 98 and 99, with conical tibia and without patellar macroseta ..... *transversalis*



Map. 2. Distribution of *Nicolepeira* species and of *Parawixia chubut*.

— Abdomen usually wider than long; that of female with at least two pairs of tubercles (Figs. 79–81); venter with black band enclosing two anterior white spots (Fig. 82); male palpus as in Figures 87–90, with tibia irregular disk-shaped (at 6:00 in Figs. 89, 90), patella with one seta (Fig. 85) ..... *flavifrons*

*Nicolepeira flavifrons* (Nicolet) new combination  
 Figures 74–90; Map 2A

*Epeira flavifrons* Nicolet, 1849: 507, pl. 5, fig. 8, ♀.  
 Female specimens from near Santiago, Chile (MININ), lost.

*Epeira hyadesi* Simon, 1884: 121, pl. 3, figs. 5, 6, ♀.

Female holotype from Isla Hoste, Orange Bay, [Prov. Antártica], in MNHN 22346, examined. Simon, 1887: 11, pl. 2, fig. 3, ♀. NEW SYNONYMY. *Araucus hyadesi*:—Simon, 1904: 95. Bonnet, 1955: 520.

*Arauca flavifrons*:—Roewer, 1942: 842.

*Arauca hyadesi*:—Roewer, 1942: 844.

*Araucus flavifrons*:—Bonnet, 1955: 503.

*Parawixia flavifrons*:—Archer, 1963: 25.  
*Parawixia zigzag* Mello-Leitão. This name may be a *nomen nudum* because no description could be found. Specimen from Maullin, Chile, in MNRJ, examined.

*Note.* *Epeira flavifrons* is illustrated in Nicolet with two pairs of lateral tubercles, leaving no doubt as to its identity. Simon adequately illustrated the epigynum of *hyadesi*, but apparently did not recognize Nicolet's illustration. Simon's specimen showed only two tubercles on the abdomen. *Epeira hyadesi* is described from a female; the male with this collection (which I erroneously marked lectotype when I examined it in 1988) was apparently added to the collection, sometime in the 19th century, before type specimens were segregated from others.

*Description.* Female from Punta Arenas, Chile. Carapace brown, eye region lightest, sides of thorax dark brown (Figs. 79, 81). Chelicerae yellow proximally, brown distally. Labium, endites, sternum brown. Coxae and distal leg articles yellow with narrow brown rings. Abdomen white with dorsal, symmetrical dark patches and lines (Figs. 79, 80); venter with narrow black band, anteriorly enclosing a pair of white spots (Fig. 82). Abdomen wider than long, with a pair of large, anterior, dorsal tubercles and three pairs of smaller tubercles (Figs. 79–81). Total length 4.7 mm. Carapace 1.8 mm long, 1.6 wide in thoracic region, 1.3 wide behind posterior lateral eyes. First femur 1.3 mm, patella and tibia 2.0, metatarsus 1.1, tarsus 0.5. Second patella and tibia 1.7 mm, third 0.9, fourth 1.4.

Male from Cordillera Nahuelbuta, Chile. Coloration similar to that of female, legs ringed. Abdomen venter black with one pair of white spots close to genital fur-

row. Abdomen wider than long (Fig. 86). Palpal patella with one macroseta. Total length 4.7 mm. Carapace 1.7 mm long, 1.7 wide in thoracic region, 1.5 wide behind posterior lateral eyes. First femur 2.0 mm, patella and tibia 2.5, metatarsus 1.7, tarsus 0.7. Second patella and tibia 2.3 mm, third 1.4, fourth 1.7.

*Note.* Males and females were collected together. Also, they share the white pigment spots on the black ventral band (Fig. 82).

*Variation.* Total length of females 4.7–6.5 mm, males 4.3–4.7 mm. The shape of the abdomen, number of tubercles, and the shape of the septum of the epigynum are variable. Figures 74–76, 80, 83–85, and 88 came from Dalcabue specimens; the specimen in Fig. 81 came from Ñuble Province. Other illustrations were made from a female from Punta Arenas, and a male from Nahuelbuta.

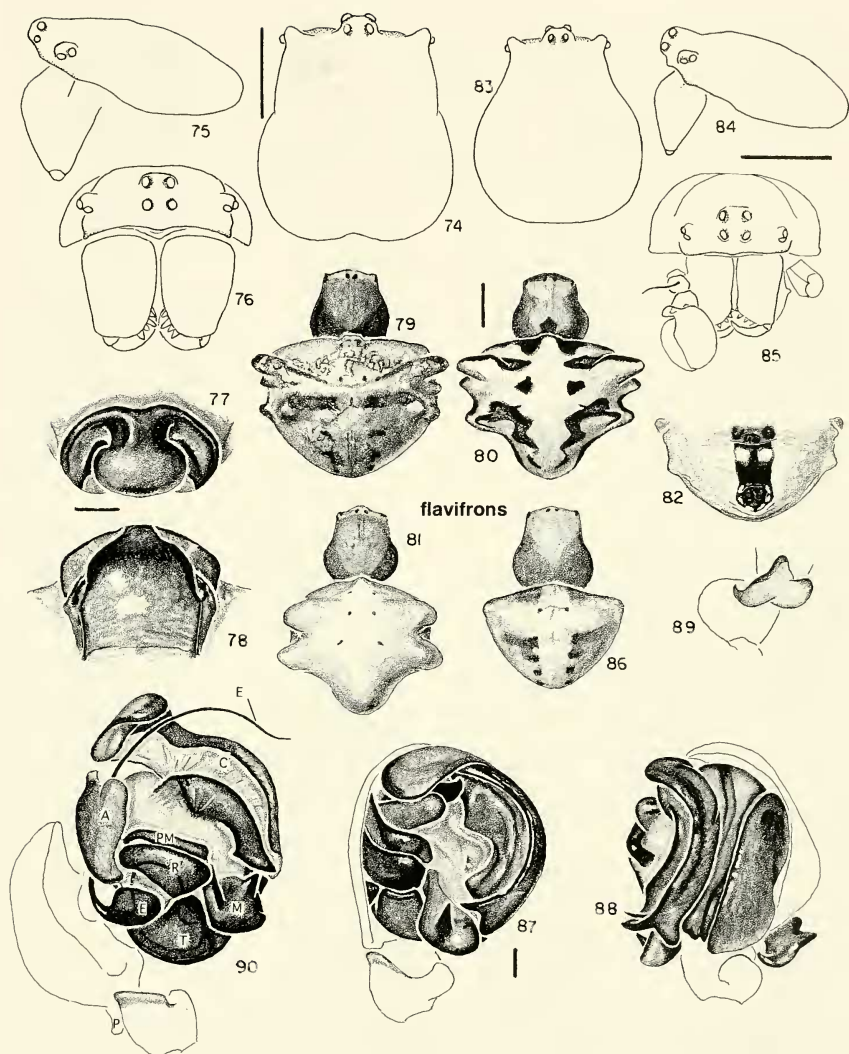
*Diagnosis.* Females are distinguished from the other two species by having the abdomen wider than long with a variable number of pairs of tubercles on each side (Figs. 79–81), a ventral black band containing an anterior pair of white spots (Fig. 82), and by the large, round septum of the epigynum (fig. 77). Males have the abdomen wider than long (Fig. 86), the palpus with a large, curved conductor (Figs. 87, 88, 90), and the median apophysis with a long tooth (Figs. 87, 90).

*Specimens Examined.* CHILE. *O'Higgins*: Cachapoal, Las Cabras, 28, 29 Dec. 1986, 1♀ (L. Umaña, AMNH). *Ñuble*: Los Lleuques [?], Dec. 1985, 3♀; Dec. 1986, 1♀ (L. Umaña, AMNH). *Malleco*: Pichinpuén, Cordillera Nahuelbuta, Jan. 1959, 9♀, 7♂ (L. E. Peña, IRSNB); Butamalal, 1200 m, 26 Jan. 1934, 1♂ (L. E. Peña, IRSNB). *Chiloé*: Dalcabue, 1–4 Apr. 1968, 1♀, 1♂ (L. E. Peña, MCZ). *Magallanes*: Punta Arenas, Quinta Pillet, 14 Jan. 1966, 1♀, 1♂; 26 Feb. 1969, 2♀ (T. Cekalovic, MCZ).

*Nicolepeira transversalis* (Nicolet), new combination

Figures 91–100; Map 2B

*Epeira transversalis* Nicolet, 1849: 493. Males and females from Chile in MNHN, lost (?). Simon, 1864: 263.



Figures 74–90. *Nicolepeira flavifrons* (Nicolet). 74–82, female. 74, carapace. 75, carapace and chelicera. 76, eye region and chelicerae. 77, 78, epigynum. 77, ventral. 78, posterior. 79–81, dorsal. 82, abdomen, ventral. 83–90, male. 83, carapace. 84, carapace and chelicera. 85, eye region, chelicerae, and right palpus. 86, dorsal. 87, left palpus, mesal. 88, palpus, ventral. 89, paracymbium. 90, palpus, expanded, mesal.

Abbreviations: A, terminal apophysis; C, conductor; E, embolus; M, median apophysis; PM, paramedian apophysis; R, radix; T, tegulum.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.

*Aranca transversalis*:—Roewer, 1942: 854.

*Aranicus transversalis*:—Bonnet, 1955: 613.

*Necoscouella transversalis*:—Archer, 1963: 28.

*Note.* Nicolet's description fits this species.

*Description.* Female holotype. Carapace yellowish, dusky brown on sides, in center underlain by white pigment; white setae on sides (Fig. 94). Chelicerae orange. Labium, endites dusky brown. Sternum dark brown. Coxae yellow. Distal articles of legs yellowish with dusky rings. Dorsum of abdomen white with anterior transverse dark band and pairs of black patches posteriorly (Figs. 94, 95); venter with dusky band from pedicel to behind spinnerets (Fig. 97). Abdomen as wide as long, with a pair of anterior, dorsal tubercles (Figs. 94–96). Total length 4.5 mm. Carapace 1.7 mm long, 1.6 wide, 0.9 wide behind eyes. Total length 3.4 mm. Carapace 1.6 mm long, 1.3 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.9 mm, patella and tibia 2.4, metatarsus 1.4, tarsus 0.5. Second patella and tibia 2.0 mm, third 1.1, fourth 1.7.

Male from Ensenada, Chile. Carapace dusky yellow, in center underlain by white pigment. Chelicerae, labium, endites, sternum brown. Coxae yellow; distal leg articles yellow with light brown rings. Dorsum of abdomen white with tiny black spots, venter with a median dusky band from pedicel to and including spinnerets. Palpal patella without macrosetae. Palpal tibia cone-shaped (Figs. 98, 99). Total length 2.9 mm. Carapace 1.5 mm long, 1.3 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.9 mm, patella and tibia 2.4, metatarsus 1.6, tarsus

0.5. Second patella and tibia 1.9 mm, third 0.9, fourth 1.4.

*Note.* Males and females were collected together.

*Variation.* Total length of females 3.5–5.5 mm, males 2.9–3.5. Figures 91–93 illustrate specimens from Las Cabras; Figure 94 specimen from Isla Teja; Figure 95 specimen from Ñuble Province; and Figures 98–100 a male from Villarrica.

*Diagnosis.* Females are distinguished by having the abdomen about as long as wide with one pair of humps (Figs. 94–97). The epigynum is without septum and without scape (Fig. 91), and the posterior median plate of the epigynum is triangular (Fig. 92). Males differ by the shape of median apophysis (center in Fig. 98) and conductor of the palpus (at 3:00 in Fig. 98), and the wide diagonal sclerite (between 2:00 and 10:00 in Fig. 99).

*Natural History.* Specimens were collected in *Podocarpus* association, at Los Muermos.

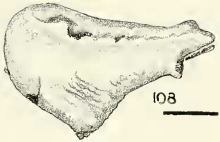
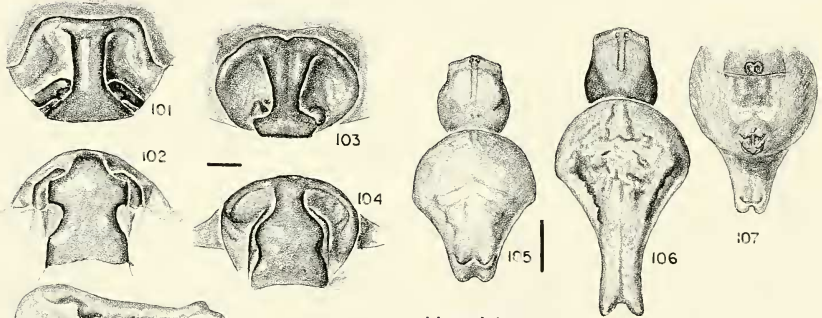
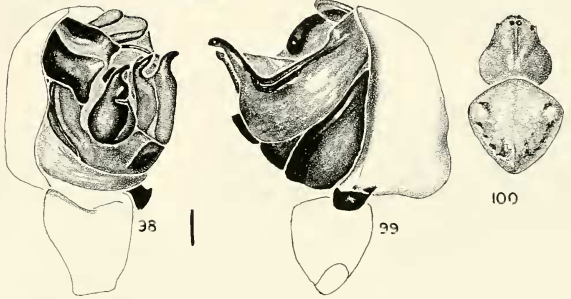
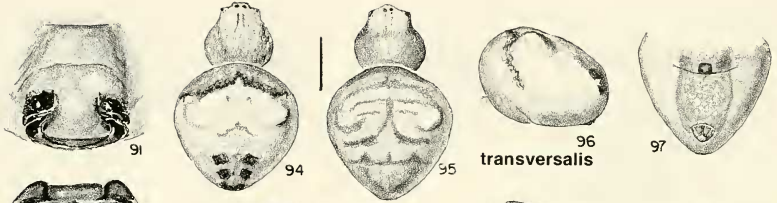
*Specimens Examined.* CHILE Ñuble: Los Llenques [?], 5–20 Dec. 1985, 2♀ (L. Umaña, AMNH). *Cachapual*: Las Cabras, 26–28 Dec. 1986, 2♀ (L. Umaña, AMNH). *Bio-Bío*: 5 km W Tucapel, 28 Dec. 1950, 2♀ (E. S. Ross, A. E. Michelbacher, CAS). *Mallico*: Contulmo, 1909, 1♀ (E. Reimoser, MCZ). *Cautín*: Villarrica, 27–28 Feb. 1979, 1♂ (L. E. Peña, AMNH); Chacamo, W Temuco, NW of Nueva Imperial, 17–23 Feb. 1981, 1♂ (L. E. Peña, AMNH). *Valdivia*: Huachocopilue, 7 Mar. 1965, 1♂ (H. Levi, MCZ); Isla Teja, 6 Mar. 1965, 2 imm., 1♀, 2♂ (H. Levi, MCZ). *Llanquihue*: 2–3 km NW Ensenada, 18 March 1965, 1♂ (H. W. Levi, MCZ); 4 km S Los Muermos, 170 m, 12 Nov. 1966, 1♀ (M. E. Irwin, E. I. Schlinger, CAS). *Chiloé*: Isla de Chiloé, Pta. Carmen, Quellón, 15–19 Mar. 1981, 1♀ (L. E. Peña, AMNH); Dalcahue, 1–4 Apr. 1968, 1♀ (L. E. Peña, MCZ). *Palena*: Chaitén, Dec. 1985, 2♀ (L. E. Peña, AMNH).

Figures 91–100. *Nicolepeira transversalis* (Nicolet). 91–97, female. 91–93, epigynum. 91, ventral. 92, posterior. 93, cleared, dorsal. 94, 95, dorsal. 96, abdomen, lateral. 97, abdomen, ventral. 98–100, male. 98, 99, left palpus. 98, mesal. 99, ventral. 100, dorsal.

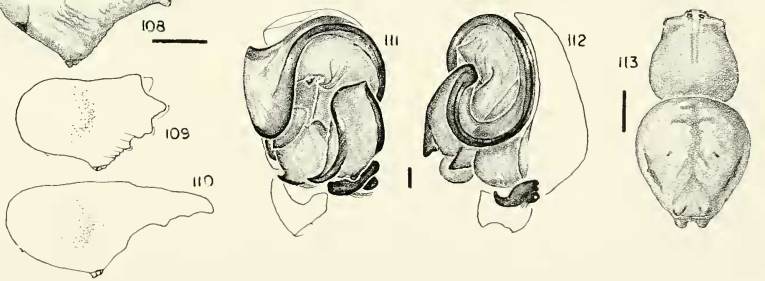
Figures 101–113. *N. bicaudata* (Nicolet). 101–110, female. 101–104, epigynum. 101, 103, ventral. 102, 104, posterior. 105, 106, dorsal. 107, abdomen, ventral. 108–110, abdomen, lateral. 111–113, male. 111, palpus, mesal. 112, palpus, ventral. 113, dorsal.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.





**bicaudata**



*Nicolepeira bicaudata* (Nicolet), new combination

Figures 101–113; Map 2C

*Epeira carenata* Nicolet, 1849: 509. Female from Valdivia, in MNHN lost. NEW SYNONYMY.*Epeira bicaudata* Nicolet, 1849: 510, pl. 5, fig. 11, ♀.

Specimens came from Chile. Simon, 1864: 263.

*Aranca bicaudata*:—Roewer, 1942: 837.*Aranca carenata*:—Roewer, 1942: 838.*Aranus bicaudatus*:—Bonnet, 1955: 442.*Aranus carenatus*:—Bonnet, 1955: 452.

*Note.* The shape of the abdomen matches Nicolet's description of *E. carenata*. However, the name *bicaudata* is used because its female was illustrated by Nicolet.

*Description.* Female from Putatrillhue, Chile. Carapace orange-brown, sides of thorax dark brown (Fig. 106). Chelicerae, labium, endites brown. Sternum dark brown. Coxae and distal leg articles light brown; distal articles ringed. Abdomen white, gray, and black with irregular patches (Figs. 105, 106); venter gray with pair of small, indistinct light patches in front of spinnerets (Fig. 107). Abdomen with a pair of dorsolateral tubercles and two pairs of posterior tubercles on an extension (Figs. 105–107). Total length 6.1 mm. Carapace 1.9 mm long, 1.5 wide in thoracic region, 1.3 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 2.3, metatarsus 1.3, tarsus 0.7. Second patella and tibia 1.8 mm, third 1.1, fourth 1.3.

Male from Dalcahue. Coloration lighter than in female. Abdomen with specks of white, venter as in female. Palpal patella with one macroseta. Second, tibia thinner than first, not modified. Abdomen with four posterior tubercles (Fig. 113). Total length 5.1 mm. Carapace 2.3 mm long, 1.8 wide in thoracic region, 1.4 wide behind posterior lateral eyes. First femur 2.5 mm, patella and tibia 3.4, metatarsus 2.0, tarsus 0.7. Second patella and tibia 2.5 mm, third 1.3, fourth 1.9.

*Note.* The only male found, the one described, is lightly sclerotized and may be freshly molted (Figs. 111–113). Males and females were matched by elimination and

on the basis of the male's similarly shaped abdomen (Fig. 113).

*Variation.* Total length of females 4.9–6.2 mm. The posterior extension of the abdomen is variable (Figs. 105–110). Figures 101, 102, 106, 109, and 110 were made from specimens from Malleco; Figures 107 and 108 from specimens from Putatrillhue; Figures 111–113 from specimens from Dalcahue. The carapace of the only male seems slightly larger than that of the female (Fig. 113).

*Diagnosis.* The female is distinguished from other species by the unusual shape of the abdomen: one or two pairs of terminal, side by side tubercles and the concave sides of the posterior of the abdomen (Figs. 105, 106). Unlike *N. flavifrons* (Fig. 77) *N. bicaudata* has the septum of the epigynum longer than wide (Figs. 101, 103). The abdomen of the male is similar to that of the female, and the enormous conductor of the palpus covers most of the palpal bulb except for an S-shaped area (Fig. 111).

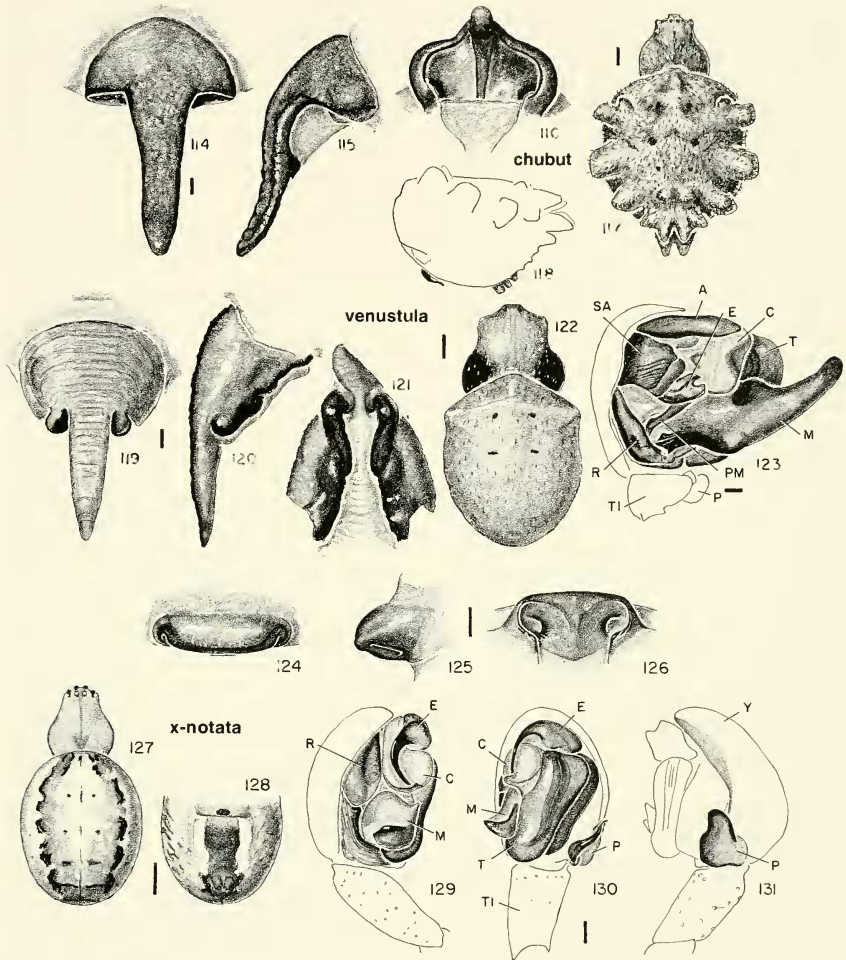
*Specimens Examined.* CHILE *Petorca*: Zapallar, 27 Nov. 1950, 1♀ (E. S. Ross, A. E. Michelbacher, CAS). *Santiago*: Q. Córdoba, coast, 15–20 Feb. 1979, 1♀ (L. E. Peña, AMNH). *Cauquenes*: Cobquecura, Tregualemu, 31 Dec. 1958, 1♀; 12–18 Feb. 1954, 1♂ (L. E. Peña, IRSNB). *Ñuble*: Los Lleuques [?], 5–20 Dec. 1985, 1♀ (L. Umána, AMNH). *Malleco*: El Manzano, nr. Contulmo, 15 Dec. 1985, 1♀ (L. E. Peña, AMNH); Puren Contulmo Natur. Mon., mixed evergreen forest, 13 Feb. 1985, 1♀ (S. J. Peck, AMNH). *Valdivia*: Puroolón, NW Panguipulli, 10 Jan. 1985, 1♀ (L. E. Peña, AMNH). *Osorno*: Putatrillhue, 12 Apr. 1968, 1♀ (L. E. Peña, MCZ). *Llanquihue*: Ensenada, 1 Dec. 1988, 1♀ (V. D., B. Roth, CAS). *Chilo*: Dalcahue, 15 Feb. 1954, 1♂ (L. E. Peña, IRSNB).

*Parawixia chubut* new species

Figures 114–118; Map 2D

*Holotype.* Female holotype from El Hoyo, Chubut, Argentina, 10 Jan. 1962 (A. Kovács) in AMNH. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace, chelicerae, labium, endites, sternum dark brown. Coxae and distal leg articles dark brown. Abdomen dark brown with



Figures 114–118. *Parawixia chubut* new species, female. 114–116, epigynum. 114, ventral. 115, lateral. 116, posterior. 117, dorsal. 118, abdomen, lateral.

Figures 119–123. *Ocrepeira venustula* (Keyserling). 119–122, female. 119–121, epigynum. 119, ventral. 120, lateral. 121, posterior. 122, dorsal. 123, male, left palpus.

Figures 124–131. *Zygella x-notata* (Clerck). 124–128, female. 124–126, epigynum. 124, ventral. 125, lateral. 126, posterior. 127, dorsal. 128, abdomen, ventral. 129–131, male palpus. 129, mesal. 130, ventral. 131, lateral with shaded paracymbium.

Abbreviations: A, terminal apophysis; C, conductor; E, embolus; M, median apophysis; P, paracymbium; PM, paramedian apophysis; R, radix; SA, subterminal apophysis; TI, tibia; Y, cymbium.

Scale lines: genitalia, 0.1 mm; others, 1.0 mm.

tiny brownish-white spots and symmetrical black patches (Fig. 117); venter without distinct marks. Eyes subequal. Anterior median eyes 1 diameter apart, 2.2 diameters from laterals. Posterior median eyes 1.2 diameters apart. Ocular trapezoid wider than long, widest in front. Height of clypeus equals 1.7 diameters of anterior median eye. Abdomen with four pairs of lateral tubercles, four pairs posterior, and one anterior median. Total length 12.0 mm. Carapace 5.1 mm long, 4.5 wide in thoracic region, 2.3 wide behind posterior lateral eyes. First femur 4.0 mm, patella and tibia 5.6, metatarsus 3.1, tarsus 1.4. Second patella and tibia 5.1 mm, third 2.9, fourth 4.7.

*Variation.* Total length of females 11.5–12.0 mm. The illustrations were made from the female holotype.

*Diagnosis.* The large and long tubercles of the abdomen distinguish *P. chubut* from other *Paravixia* species. The epigynum (Figs. 114–116) has a relatively long scape and a transverse posterior median plate.

*Natural History.* The specimens from El Bolsón (Feb. 1961) were collected from a wire fence at night.

*Specimens Examined.* ARGENTINA *Río Negro*: El Bolsón, 1955, 1♀; 1 Feb. 1961, 8♀, 14 imm.; 27 Sept. 1961, 4 imm. (all A. Kovács, AMNH). *Chubut*: El Hoyo, 1958, 1♀, 1 imm. (A. Kovács, AMNH). CHILE *Cautín*: *Río Huachitivo* [?], 12 Feb. 1981, 1♀ (T. Cekalovic, AMNH).

### *Ocrepeira venustula* (Keyserling)

Figures 119–123

*Epeira venustula* Keyserling, 1880: 308, pl. 4, fig. 11, ♀. Female holotype from Nova Friburgo, Est. Rio de Janeiro, Brazil, in the L. Koch collection, lost.

*Araneus albisecta* Mello-Leitão, 1936: 127, pl. 15, ♀. Female holotype from Papudo, [Prov. Petorca], Chile (MNRJ), lost. Bonnet, 1955: 127. NEW SYNONYMY.

*Aranea albisecta*.—Roewer, 1942: 886.

*Molinaraica albisecta*.—Levi, 1991: 177. Platnick, 1993: 451.

*Ocrepeira venustula*.—Levi, 1993: 94, figs. 29–33, 143–154, ♀, ♂.

*Note.* Mello-Leitão's illustration of *A. albisecta* is recognizable.

*Description.* Female from Angol, Chile.

Carapace brown, with white setae, sides dark brown (Fig. 122). Chelicerae, labium, endites dark brown. Sternum uneven brown. Coxae and distal leg articles brown with indistinct darker rings. Abdomen brown with a transverse white line between two tubercles (Fig. 122); area anterior of white line darker than area posterior of line; venter brown. Abdomen with a pair of dorsal tubercles (Fig. 122). Total length 9.3 mm. Carapace 4.3 mm long, 3.5 wide in thoracic region, 2.3 wide in cephalic region. First femur 3.6 mm, patella and tibia 4.8, metatarsus 3.0, tarsus 1.3. Second patella and tibia 4.4 mm, third 3.6, fourth 4.8.

Male from Ñuble, Chile. Coloration lighter than that of female. Carapace, sternum, coxae, light brown. Distal leg articles light brown, ringed darker brown. Abdomen with gray folium and brown tips of humps, venter gray with an indistinct pair of white patches in front of spinnerets. Ocular quadrangle square. Clypeus height equals 1.8 diameters of anterior median eye. Endite with tooth. Palpal patella with one macroseta. First coxa with hook. Third and fourth coxa and trochanter each with one short macroseta. Femora, except third, with a line of short, ventral macrosetae. Abdomen as in female. Total length 5.0 mm. Carapace 4.1 mm long, 3.6 wide in thoracic region, 1.6 wide behind posterior lateral eyes. First femur 3.8 mm, patella and tibia 4.8, metatarsus 3.0, tarsus 1.0. Second patella and tibia 3.9 mm, third 2.7, fourth 3.9.

*Variation.* Total length of females 7.3–9.3 mm, males 5.0–8.3 mm. The illustrations are of a female from Angol and the male from Pinto.

*Diagnosis.* The scape beyond the base of the epigynum is about as long as the length of the base (Fig. 119). The shape of the large median apophysis distinguishes the male from others (Fig. 123).

*Records.* CHILE *Elqui*: La Serena, Feb. 1947, 1♂ (M. Pino, AMNH); 50 km S La Serena, Dec. 1950, 1♂ (E. S. Ross, A. E. Michellbacher, CAS). *Choapa*: El Bato, E of Illapel, 10 Oct. 1985, 1♂ (L. E. Peña,

AMNH). *Sau Felipe*: Putaendo, 28 Nov. 1981, 2♀ (M. Pino, AMNH). *Región Metropolitana*: San Manuel, S of Melipilla, 6–8 Dec. 1980, 1♂ (L. E. Peña, AMNH). *Talca*: 35 km N Talca, 22 Dec. 1950, 1♀ (E. S. Ross, A. E. Michelbacher, CAS). *Concepción*: Escuadrón, 11 Nov. 1979, 1♂ (T. Cekalovic, AMNH). *Ñuble*: 4 km E Pinto, 5 Jan. 1976, 1♂ (G. Moreno, MCZ). *Malleco*: Angol, 29 Jan. 1951, 6♀, 2♂ (E. S. Ross, A. E. Michelbacher, CAS). *Cautín*: 16 km NE Pucón, 12 Jan. 1951, 1♀ (E. S. Ross, A. E. Michelbacher, CAS).

*Zygiella x-notata* (Clerck)  
Figures 124–131

*Araucus x-notatus* Clerck, 1758: 46, pl. 2, fig. 5. A Clerck specimen bearing this name in NRMS, not examined.

*Zilla bösebergi* Keyserling, 1878: 575, pl. 14, figs. 4, 5, ♀, ♂. Female and male syntypes from Uruguay in BMNH. Synonymized by Levi, 1974.

*Larinia maulliana* Mello-Leitão, 1951: 331, figs. 5, 6, ♂. Male holotype from Maullín, Chile. Synonymized by Levi, 1974.

*Zygiella x-notata*:—Levi 1974: 276, figs. 21–31, 57, 58, ♀, ♂.

**Description.** Female from Peulla, Llanquihue, Chile. Carapace orange (Fig. 127). Chelicerae, labium, endites, sternum orange. Coxae and distal leg articles orange, ringed brown. Abdomen white with dorsal dark patches and lines, forming a large oval (Fig. 127); venter with median black band bordered by white band on sides (Fig. 128). Eyes subequal. Anterior median eyes their diameter apart, their diameter from laterals. Posterior median eyes 0.8 diameter apart, 1.5 diameters from laterals. Ocular trapezoid square. Height of clypeus equals 0.6 diameter of anterior median eye. Abdomen oval, widest in middle, without tubercles (Fig. 127). Total length 6.9 mm. Carapace 2.6 mm long, 2.2 wide in thoracic region, 1.4 wide behind posterior lateral eyes. First femur 3.4 mm, patella and tibia 4.3, metatarsus 3.2, tarsus 0.1. Second patella and tibia 3.2 mm, third 1.85, fourth 2.6.

Male from Llanquihue Prov., Chile. Coloration slightly darker than in female. Eye sizes and spacing as in female. Clypeus height 0.8 diameter of anterior median eye. Endite with tooth, faced by a tubercle on palpal trochanter. Palpal tibia cone-

shaped (Figs. 129–131), patella with one macroseta. First coxa without hook. Second tibia thicker than first. Abdomen as in female. Total length 5.5 mm. Carapace 3.0 mm long, 2.4 wide in thoracic region, 1.3 wide behind posterior lateral eyes. First femur 3.6 mm, patella and tibia 5.7, metatarsus 5.0, tarsus 0.9. Second patella and tibia 3.3 mm, third 2.0, fourth 2.8.

**Note.** The illustrations were made from specimens from Llanquihue Prov., Chile.

**Diagnosis.** The coloration, abdomen widest in middle (Figs. 127, 128), and the slightly projecting epigynum distinguish females (Figs. 124–126); the palpal structure and cone-shaped tibia (Figs. 129–131) distinguish males.

**Palpal Structure.** The cone-shaped palpal tibia (TI in Figs. 129–131) has numerous trichobothria. The paracymbium (P in Figs. 130, 131) is modified into a plate. The saberlike embolus (E) lies on the conductor (C). The conductor (C) of *Zygiella* is attached to the edge of the tegulum (T in Fig. 130). The round median apophysis (M) is attached “below” the radix (R in Fig. 129) and does not project from the bulb as it does in *Ocrepeira* (Fig. 123) or *Molinaranea* (Fig. 19). The paramedian apophysis (PM in Fig. 123) terminal apophysis (A), and subterminal apophysis (SA), not found in *Zygiella*, are present in *Ocrepeira* (Fig. 123) and *Molinaranea* (Fig. 19).

**Natural History.** This species is imported from Europe. In Chile, *Z. x-notata* is found on man-made structures, garden fences, houses. The upper half of the orb-weaver has a section that lacks sticky lines.

**Records.** ARGENTINA *Buenos Aires*: Buenos Aires, 25 Mar. 1912, 1♀ (J. Methes, MACN); Tres Arroyos, 38°23'S; 60°17'W, 15 Jan. 1943, 1♂ (Sorgentini, MLP); Estación Río Luján del Ferra Carril Mitre, 11 Jan. 1980, 2♀ (Zanetk, Goloboff, MACN). CHILE *Juan Fernández Isl.*: Mas Afuera Quebrada Casa, 13–31 Mar. 1962, 1♀ (B. Malkin, AMNH). Common from Santiago south to Puerto Montt.

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